COMPUTERWORLD

Novell engineering AppWare comeback

By Laura DiDio

Seeking to erase two years of fumbling and false starts, Novell, Inc. will attempt to resuscitate its oft-maligned AppWare strategy at its annual developers conference in Salt Lake City this week.

At Brainshare, Novell will kick off an AppWare renaissance that recasts the architecture as a "focused, well-defined set of tools that will enable power users to develop desktop applications that explicitly leverage NetWare 4.1's network services," said Joe Firmage, Novell's vice president of strategic planning for the NetWare Systems Group.

This latest AppWare initiative is a retrenchment. Novell's original intent was to promote AppWare as the foundation on which all cross-platform development would be based.

In 1993, AppWare consisted of two agendas, noted Leo Spiegel, chief technology officer at LAN Systems, Inc., a New York integration company. One was AppWare Foundation, a low-level applica-

AppWare, page 29

Are you concerned that Novell has altered its AppWare strategy and lacks a cohesive focus for delivering server-based applications?

Yes	33%
Don't know	33%

Base: 200 Novell users

Back to basics

Supermarket chain shelves object technology, outsources IS

By Julia King

Two years after an auspicious technology launch, debt-laden Kash n' Karry Food Stores, Inc. is pulling the plug on its highly ambitious, but apparently unaffordable, object-oriented software plans.

Last week, new executives at the recently reorganized $1 billion grocery chain also disclosed plans to outsource all information systems operations, including development of a new mainframe-based procurement system and store-based point-of-sale systems, to GSI Co. The French outsourcer's clients include major European retailers.

Both moves reflect a back-to-basics IS strategy for Tampa, Fla.-based Kash n' Karry, whose early and aggressive moves into object technology made it a high-tech maverick in the rela-

tively low-tech business of grocery stores.

Among other things, Kash n' Karry built its own object-oriented language, database and development tools using public-domain software available on the Internet [CW, March 1, 1993]. It also served as a test bed for a Unix-based object-oriented tool set from a tiny, unknown start-up company, Obero Software, Inc., which later went out of business.

Too close to the edge

The projects cost an estimated $1.5 million over three years, according to one source close to the company.

"I think we probably were a little too far out on the leading edge, and we learned a lot from it. But we have to remember we're in retail

Supermarket, page 117

Kash n' Karry is not a bankruptcy and abandoning object technology. The retailer's cutting-edge IS plans were too costly to maintain. It has cut back on its grocery and liquor store chain remains saddled with debt of more than $390 million.

Chasing demons

To catch up with rivals Oracle and Sybase, Informix must meet the following key challenges:

- ◆ Persuade base of old users to plunge into object programming with New Era tool
- ◆ Coax more independent software developers to support its OnLine database
- ◆ Catch up in the workgroup segment
- ◆ Add more technical support staff

IS lacks 'net strategy

By Ellis Booker

On April 5, Marcy Rood will name one lucky winner of a 1995 Nissan Sentra.

What makes this car contest unique is that it is being conducted entirely in cyberspace. It is taking place on the home page of Dealernet, a complete listing of automotive manufacturers and dealers.

Savvy strategies for marketing in cyberspace — from the design of a World-Wide Web home page to incentives that lure visitors back a second time — are evolving quickly (see page 14).

But its flurry of activity may leave in-

formation systems executives in the dust if they fail to grab a leadership role. IS departments can make their mark today by helping marketing departments deploy the right kinds of enabling technologies, said Neal Goldsmith, president of Tribeca Research, Inc. in New York.

"Their proper role is to be aware of the new technologies and what competing IS shops are doing," said Goldsmith, author of a just-released research report titled "Doing Business on the Net."

Goldsmith confirmed the worrisome impression that at many user companies, it is the marketing communications

IS lacks, page 14

Informix fights also-ran image

By Kim S. Nash

Late last year, MCI Communications Corp. brought in database and tools from Informix Software, Inc. for a giant data warehousing project. Sybase, Inc.'s System 10 — the database on which MCI had all but standardized — had buckled under pressure during testing.

"We tried making it work with Sybase at first, but this is just too much data, too massive," said Jim Polk, vice president of information technology at MCI's consumer markets group in Arlington, Va. Informix's OnLine 7.1 database outperformed Sybase's System 10 in parallel query processing and data loading and indexing, Polk said.

While Sybase has won its share of data warehousing contracts, the MCI deal reflects newfound strength at Informix.

Informix, page 32

Coexistence approach wins

By Rosemary Cafasso

Judging by the dollar signs, the multibillion-dollar client/server applications market is a runaway success.

But users are not racing to make wholesale changes with this technology, according to IS professio-

nals at several large companies.

Beyond nagging issues of reliability and robustness, which tend to slow migration plans, many users or companies are crafting near-term coexistence strategies between mainframes and client/server systems.

Du Pont Co. and FedEx Corp., for example, are strong proponents of coexistence approaches, even though such environments can be more complicated to manage. Typically, coexistence calls for information systems shops to perform additional work in data synchronization, interface programming and application integration.

Coexistence, page 117

Management, page 81

- Microsoft has prepared a planning guide for users getting ready to deploy Windows 95, and users offer their own tips. *News, page 4*

- Digital is on the right track with its reorganization, but the company isn't entirely out of the woods yet. *News, page 6*

- IBM plans a series of enhancements to make its distributed storage management software more useful in shops that are investing in other hardware platforms. *News, page 8*

- Microsoft's delay in shipping Exchange may cost the company some users. *News, page 10*

- As Windows 95's final beta begins to ship, Microsoft appears ready to break a key barrier to Windows NT on fault-tolerant systems. *News, page 12*

- ATM devices, "fast" Ethernet switches and remote-access products top the list of introductions due at the Networld/Interop show. *News, page 15*

- CompuServe acquires Internet-access software maker Spry, Inc. *News, page 39*

- X/Open plans to create specifications for networked services, including naming, security and directory services. *News, page 15*

- Many CEOs are bursting with curiosity about the IS world, But Bill Laberis maintains they just need to feel more secure about exploring it. *Editorial, page 35*

- Dysfunctional IS offices come in all varieties, Thornton A. May says. *Viewpoint, page 37*

- In the relationship between testers and developers, a case can be made either way for collaboration or competition, Michael Schrage maintains. *Viewpoint, page 37*

- Intel's chip rivals prepare challengers to Pentium, but it is the P6 that will give Intel the performance edge for the next few years. *Desktop Computing, page 41*

- IBM attempts to counter the potential Windows 95 juggernaut by enhancing OS/2 Warp Connect. *Desktop Computing, page 57*

- Sun is stretching its Solaris operating system at both ends — providing new support in its Solaris 2.4 release for Intel machines as well as improved support for high-end SPARC servers. *Workgroup Computing, page 47*

- Vendors take action to protect users from the malicious use of attack scanners, which look for security holes in networks. *Enterprise Networking, page 57*

- A redesign of Lease Plan U.S.A.'s corporate fleet operations is expected to save the firm $2.8 million over five years with the help of an IBM AS/400-based imaging system. *Large Systems, page 67*

- Closer Look: The key to object-oriented success has little to do with tool kits. Instead, choosing a language and a methodology with care will satisfy the fundamentals and ensure a smoother ride, many adopters say. *Application Development, page 73*

Closer Look
Object-oriented programming

- Gordon Bell previews a future in which plugging into a worldwide network is as easy as getting a dial tone. *In depth, page 55*

- Tips for testing IS skills are few and far between. Hiring managers rely on a candidate's experience and internally developed tests to determine technical proficiency. *Careers, page 94*

- Tips for reviewing client/server development plans. A compendium of past practices. *Marketplace, page 106*

- Telecommunications companies will provide more and more computer services, Charles Babcock says. *Commentary, page 118*

Executive Briefing

After a headlong rush into object-oriented applications, Kash n' Karry Food Stores has given in to a shortage of cash, placing new object development projects on hold and re-embracing mainframe-based applications. The grocery store chain also revealed plans to outsource all IS operations, including development of new procurement and point-of-sale systems. *Page 1*

Elsewhere in the object development world, this week's Object World show will feature the launch of visual tools from Cadre Technologies and IBM. *Page 16.* And users advise focusing on languages and methodologies when launching an object-based project. *Page 73*

Don't let the size of the market fool you. Client/server is a success but not an outright winner in enterprise computing strategies. Companies nowadays say they are moving slowly to client/server technology, keeping their hand in legacy applications by developing coexistence plans for client/server systems and mainframes. *Page 1*

Marketers have begun descending on the Internet, where they are already learning volumes about what works and what doesn't in cyberspace. *Page 1.* Meanwhile, First Union Corp. is racing forward with a service that will provide its 10 million customers with electronic shopping and banking via the Internet. *Page 14*

Information warfare is a clear and present danger. Electromagnetic pulse transformer bombs, van Eck phreaking and other cyber weapons could cost an unprepared company millions. In this month's Leadership Series article, "Prepare Yourself for Information Warfare," M. E. Kabay discusses what IS managers need to know to plan a defense. This special insert follows page 48.

Information
Leadership Series

The 5th Wave *by* Rich Tennant

"Now, where, someone rings my doorbell, the current, gizo, so a timer that digitizes the audio impulses, and sends the image to the PC where it's converted to a Fax file. The image is then animated, compressed, and sent via high-speed modem to an automated phone service that sends an E-mail message back to tell me someone was at my door 40 minutes ago."

Migration, training top Win 95 concerns

Users wonder: Will operating system curb desktop costs?

By William Brandel

Faced with rising costs associated with desktop management, users last week said they remain highly skeptical of Microsoft Corp.'s contention that Windows 95 will lower their desktop costs.

All but one of a half-dozen users contacted last week by *Computerworld* said they do not believe their desktop management costs will go down — with or without Windows 95.

"Windows 95 may give you more centralized administration support, but it will also bring other complexities with it," said Marty Graham, LAN administrator at Bearings, Inc. in Cleveland. "There [are] going to be hardware issues, networking and support issues that come with it."

"There's going to be a lot involved in the installation, training and implementation," said William Wheeler, microcomputer user support manager at Michigan State University in East Lansing. "After all is said and done with that, our management needs will remain about the same."

A recent report by International Data Corp. (IDC) in Framingham, Mass., backs up such skepticism. By the end of 1996, users will spend more than $400 million for training and support for Windows 95 migration, IDC analysts estimated.

Yet these costs do not include the amount that information systems departments will pay to internally support bad train users, the analysts said. As such, users can collectively expect a $1 billion-plus training price tag with the initial migration to Windows 95.

For its part, Microsoft officials adamantly deny that Windows 95 migrations will be costly or difficult to carry out. Backing up Microsoft's claims is a recent report published by Forrester Research, Inc. in Cambridge, Mass. The report contends that the $6,170 annual support cost per desktop that users pay today will be cut in half by 1998. That reduction will come, in large part, from reduced administration costs under Windows 95, according to Forrester.

U.S. estimated training costs for Windows 95

Source: International Data Corp., Framingham, Mass.

The research firm based its conclusions on new features in Windows 95, such as the system registry on which new asset management and electronic software distribution utilities will be based [CW, March 13]. Forrester estimated that users will need only one administrator per 100 desktops compared with one for every 50 machines today.

"By using the registry, that should save us some money," said Wilson Nabarro, PC coordinator at Pacific Energy Corp. in Commerce, Calif. "But I also might bring some complexity we haven't dealt with before."

Foremost among these complexities will be supporting more appli-

cations per desktop, which will take advantage of more features in the operating system. IDC estimates users will run 15 or more applications on Windows 95 compared with fewer than 12 applications on Windows 3.1 desktops and seven on DOS.

These applications will take greater advantage of multimedia and networking features. That, in turn, will require more planning and support and, frequently, more system resources.

In addition, all the major software vendors plan to soup up the networking features in their applications suites. For example, Microsoft announced last week that it would include a group scheduler in the Windows 95 version of its Office suite. Meanwhile, WordPerfect, the Novell, Inc. Applications Group, and Lotus Development Corp. plan to enhance their suites' networking capabilities.

"Obviously, putting the networking features in suites will add to the amount of planning and preparation you will have to [do] before implementing Windows 95," said John Hurd, assistant deputy director for MIS at the Ohio Department of Human Services in Columbus.

Microsoft, beta testers offer tips

By Stuart J. Johnston

● While Microsoft Corp. readies its late March rollout of a large-scale preview beta for Windows 95, it is also pulling together a simple guide designed to help computing managers migrate to the new operating system.

Simultaneously, some pioneering users who are already well along the migration path last week offered some tips of their own — which in some cases go well beyond Microsoft's suggestions.

Microsoft's forthcoming Windows 95 Migration Planning Kit and the Windows 95 Resource Kit feature a six-step plan designed to smooth some of the bumps in what could still be a rocky ride. The plan comprises the following steps:

- Review the Windows 95 features.
- Assemble a planning team, which should include help desk and training staffers.
- Specify the preferred network client configuration.
- Conduct a lab test to make sure Windows 95 works with the hardware and software users need.
- Plan and conduct a pilot rollout on a few machines and then review and adjust final deployment plans.
- Throughout the process, plan to give users a small amount of just-in-time training so they receive Windows 95 and then plan more extensive training for those users who need it later.

"Maybe we're ahead of the curve, but we've already gone through a mini version of that [six-step program] already," said Hank Coleman, chief financial officer at Aline Corp. in Dallas.

Aline's Southern Hospitality Systems unit develops and deploys Windows-based point-of-sale business software for hotels and restaurants. In that role, Coleman said, his company will deploy as many as 10,000 units of Windows 95 at customer sites nationwide. Careful planning for the rollout is therefore a must.

"I think the biggest consideration there is how aggressively your customer base wants to [move to Windows 95]," Coleman said. For early deployment to succeed, he added, "you have to have advocates."

Power users first

The tactic of deploying Windows 95 first to users who enjoy being on the "bleeding edge" of new technologies is a common thread among many PC managers.

"We're going to give it to our power users [first] because they're clamoring for it right now, [and] the expectations will be that new machines will come with it," said Don Barkett, associate professor of information sciences at Gonzaga University in Spokane, Wash. But, in general, he added, "we're going to roll it out slowly."

Others offered some less obvious recommendations.

For example, Wayne Hedrick, a systems manager at a federal government installation in Newport News, Va., suggested what for some may be a radical step: Install Windows 95 directly over existing DOS and Windows configurations. That way, Windows 95 will recognize all critical user applications without their having to be reinstalled.

He also recommended eliminating the desktop systems utilities such as memory managers and disk compression prior to the installation to avoid any unnecessary conflicts. Windows 95 provides its own 32-bit memory management and a DOS-compatible file system with optional disk compression.

"Take your systems down to a basic [configuration] and you won't have any problems [because] you won't need things like QEMM and Stacker," said Hedrick, whose facility has a network of 90 PCs.

Jurist defends ruling

By Mitch Betts
WASHINGTON

In an unusual bid to sway the appeals court, U.S. District Court Judge Stanley Sporkin last week defended his Feb. 14 ruling in the contentious Microsoft Corp. antitrust case, which is now expected to take a year or more to resolve.

Sporkin said he refused to rubber-stamp the U.S. Department of Justice's antitrust settlement with Microsoft because the government would not provide details of the investigation and negotiations.

The jurist said he wanted to know "what was bargained away in secret at the negotiating table" and whether there was a "side deal" promising leniency on other

antitrust issues.

Anne K. Bingaman, head of the department's Antitrust Division, said no side deals exist. She previously denied that any charges were bargained away.

Sporkin rejected that side settlement, which focuses on Windows licensing policies, leading both Microsoft and the Justice Department to appeal the ruling.

The judge's 12-page decision, meant to "set the record straight," was part of an otherwise routine order canceling a status meeting.

Several antitrust experts have

Judge Stanley Sporkin
wanted more details

predicted that the higher court will find fault with Sporkin's ruling, but that may not produce fast approval of the decree. The appeals court is likely to remand the case to Sporkin with specific instructions on how to review it, predicted George Reed-Dellinger, an analyst at NatWest Washington Analysis, a Washington research unit of NatWest Securities Corp.

"The guidelines are likely to be so narrow that Judge Sporkin will have little choice but to approve the decree," he said. But Sporkin "could make life difficult for Microsoft by demanding certain modifications and conditions."

DEC future brightens

Revenue growth expected; user confidence grows

By Neal Weinberg

Digital Equipment Corp. is not out of the woods yet, but there is a growing sense among users and analysts that the embattled company's reorganization is working.

In the slash-and-burn phase of the turnaround, Chief Executive Officer Robert Palmer cut the workforce in half, sold off chunks of the business, tossed out matrix management and created separate business units.

The next reduction move — essentially complete except for about 3,000 additional layoffs, which will bring the head count to 60,000 — brought Digital a tiny profit of $18.9 million in the quarter ended Dec. 31, 1994. But analysts are split on whether the company will make money in the traditionally weak third quarter, which ends March 31.

"The challenge now is to grow revenue at a space closer to that of the industry on a sustained basis," said William J. Milton Jr, an analyst at Brown Brothers Harriman & Co. in New York. To accomplish that, Digital wants to become a high-volume commodity hardware vendor through indirect channels, while servicing its largest accounts with its direct sales staff.

Longtime Digital users are more confident about the company's future these days. "They seem to be getting in better shape," said Charles Smart, vice president of group technology at the Citibank Private Bank in Long Island City, N.Y. "We're proceeding with them on the basis that they're going to be a strong first-tier vendor."

A long haul

There is no "silver-bullet, overnight cure," said Frank Brake, managing director for technology business development at Newport News Shipbuilding in Newport News, Va. But he said he considers Digital's turnaround a real one.

"The company is headed in the right direction, but the road is long and challenging," said Tom Wilmott, a vice president at Aberdeen Group in Boston.

For one thing, Digital has to patch up customer relations — with resellers, industry partners and users — that became frayed while the company was distracted by its internal woes.

The company's channels strategy has come a long way, but it still has a long way to go, said Greg Casia, president of the Digital Dealers Association. Red tape is one issue: The Digital price book still lists more than 20,000 part numbers. And the company is having problems modulating conflicts among the various levels of distributors and resellers.

Problems with Digital support also remain in the minds of some resellers. Ken Fohrs, vice president of ACS Systems, Inc, a Digital partner in Jacksonville, Fla., said it is becoming harder to deal with the company. "We've got getting the same support today we were getting a year ago, and because of that, the amount of business we're doing with Digital is slipping this year," he said.

John Vilandre, MIS coordinator at the epidemiology department of the University of Minnesota in Minneapolis, remains worried about Digital's long-term support for the VMS operating system. He said he is still waiting for Digital to port a specific VAX-based mail application to the Alpha platform.

Future financials

On the financial side, Digital's revenue growth is expected to come from a number of areas.

One bright spot is sales of its Unix implementation, OSF/1, said Richard Chu, an analyst at Cowen & Co. in New York. The company is also showing strong increases in PC sales, the Alpha 2100 server is selling briskly, the components and peripherals division is on a roll, and the VAX/VMS line continues to hold up surprisingly well among long-time customers.

In fact, Digital claims that the number of licensed OpenVMS end users is growing beyond its current 10 million figure. That also includes customers who are moving from VAX to Alpha, an increasing number of users on individual systems and new customers running OpenVMS on Alpha.

But concern lingers that Digital has failed to make more gains from its move to a 64-bit RISC architecture. Chip sales have been disappointing and the world is hardly bearing down its door looking for 64-bit systems.

Thomas W. Wise, vice president of information systems at Baptist Medical Center in Jacksonville, Fla., said 64-bit speed means virtually nothing to him in his search for an information management system. He is interested in a low-cost solution. "I'm not sure I need to buy a Mercedes every time I buy a car to get from Point A to Point B," he explained.

Taking a decidedly pessimistic view of Digital's situation was Richard Buchanan, an analyst at Forrester Research, Inc. in Cambridge, Mass., who gave Digital only a 40% chance of survival. Digital's attempt at high-volume commodity sales is risky because other players already have the market share and momentum, he said.

Fohrs shared some of Buchanan's concern. "At this point you can compare over the long run strictly on a price basis," the reseller noted. "You just get battered and battered and battered."

Wireless auction may be high-stakes gamble

By Michael Fitzgerald

Forget Las Vegas. For real high-stakes poker, Washington, D.C. is the place to be. Or so it seems after 15 players antied up more than $7 billion to close out three months of wireless auctions last week.

The successful licensees are expected to yield competition for the existing cellular phone players and provide a way for cellular carriers to offer national networks to consumers.

Yet it may turn out to be an expensive gamble for the firms that spent so much to secure licenses in the broadband personal communications services (PCS) spectrum because many carriers think it could take another $7 billion to build out the new networks. That could mean that some license winners will end up money losers.

Slice of a limited pie

"The FCC has created a situation where a lot of vendors are fighting over a finite number of customers," said Dick Shaffer, editor of the New York-based newsletter "ComputerLetter." He also predicted that the advent of PCS will create more competition for wireless communications, which is "bound to cut prices" for end users. Price drops could spur more people to buy cellular phones and other devices.

Users may also be losers in this wireless game. Some observers maintain that the new licenses will lead to a confusing technological muddle in the market.

"I think this is bad for consumers," said Alan Reiter, editor of "Mobile Data Report," a newsletter in Alexandria, Va. He said that by not creating any nationwide licenses, the Federal Communications Commission made it very difficult to achieve economies of scale, made standards less elusive and limited the ability of vendors to provide well-integrated services.

Vendors will have plenty of time to address these issues: For instance, it will be 1997 before initial broadband PCS service is available from AT&T Corp.'s McCaw Cellular Communications, Inc. unit, according to a spokesman.

More money

The costs that license holders have to consider in addition to upfront license fees include the following:

- The cost of buying real estate to put up new towers.
- Payments to move existing users to other slices of spectrum.
- Developing new devices that will function at both the 1.8-GHz PCS frequency and the 850-MHz cellular frequency.

Users may also find vendors reluctant to let their networks interoperate with those of other carriers. For starters, the cellular network today is analog, and PCS will be digital. This means dual-mode analog/digital phones and modems must be developed.

Meanwhile, most of the nation's cellular carriers are looking to convert their analog networks to one of two digital technologies — Time Division Multiple Access and Code Division Multiple Access. Phones and peripherals may leave it cumbersome to accommodate these as well.

Despite the naysayers, the auctions may still yield some intriguing developments for corporate users, including the following:

- The biggest bidder was WirelessCo L.P., a consortium comprised of Sprint Corp., cable carrier Comcast Corp.; multimedia mogul Cox Enterprises, Inc.; and cable carrier Tele-Communications, Inc. WirelessCo has the potential to be the largest wireless player and could have a leg up on the cable/computer convergence some have predicted.
- More competition in both the local and long-distance markets. For instance, AT&T's 21 new licenses, combined with McCaw's existing cellular network, could enable AT&T to offer local service in most major metropolitan areas.

Digital manages many LANs

By Neal Weinberg

Digital Equipment Corp. will offer relief for administrators juggling multiple LANs with a Windows-based platform that can manage network operating systems from different vendors.

"It allows us to do seamless communications between networks," said Tom Foley, executive vice president of Bay State Computer Group in Boston, which has been testing the software called ManageWorks, to be released this week.

ManageWorks brings the kind of control these information systems managers and end users are accustomed to in the LAN environment, said Scott Gooseman, executive vice president of technical services at Alpha Network Technologies, Inc., a Digital reseller in Gaithersburg, Md. "It's desperately needed," Gooseman said.

ManageWorks represents a new line of products built to compete on the open market rather than to run on Digital systems first and then be adapted for other vendors' platforms, said Papy Allen, group marketing manager for network integration software at Digital. ManageWorks runs on LANs from Novell, Inc., IBM and Microsoft Corp.

Digital plans to market the $995 ManageWorks through resellers. It is positioning it at sites with 100 to 600 users.

IBM storage software heads for other platforms

By Craig Stedman

■ Trying to expand the distance it can see beyond its own nose, IBM is planning a series of enhancements to its market-leading distributed storage management software. The changes will enable the product to be used more widely in shops with non-IBM hardware.

First up is a late-April shipment of Adstar Distributed Storage Manager (ADSM) server releases for Unix systems from Hewlett-Packard Co. and Sun Microsystems, Inc. Those will be the first notable platforms to get server-level support for ADSM, which manages network backup and archiving of infrequently used data from disk drives to less-expensive tape and optical storage devices.

A Windows NT server is due to follow late this year or early next, and IBM confirmed last week that it will expand the distributed nature of ADSM next year by enabling data to be migrated between multiple tiers of servers.

Closer to delivery is Version 2 of ADSM, which should ship in June with a new queue management feature that automates the scrubbing of client disk drives after data has been backed up to a server, IBM officials said.

Offering support

IBM already supports HP, Sun and various other Unix platforms as ADSM clients, and it cuts a much wider enterprise swath than competing storage management vendors do, said Paul Mason, an analyst at International Data Corp. in Framingham, Mass. Nevertheless, users "basically had to be IBM-centric shops to be interested" in ADSM because of the lack of other servers, he added.

The plan to embrace HP and Sun boxes as servers is just in time for Peter Ray, lead technical specialist at Valero Energy Corp. in San Antonio. Valero expects to anoint IBM, HP or Sun as its Unix vendor of choice in the next couple months. Having the flexibility to put ADSM on any of those platforms is important to the diversified energy company, Ray said.

For now, Valero runs ADSM on a trio of OS/2 servers that "were

sitting around idle," Ray said. However, those systems are "pretty well maxed out" by the current workload of backing up 40 LANs and 10 database servers, he said. As a result, Valero is looking at upgrading ADSM to a more robust Unix machine.

Support for non-IBM hardware "adds another dimension" to ADSM, said Gretchen Thiele, lead analyst for centralized technical services in the information technology business unit at IBM in St. Paul, Minn. IBM has both HP and Sun systems set up as clients of its mainframe-based ADSM server, and it wants to be able to configure those as servers in their own right, she added.

That capability will become es-

IBM's ADSM storage management software supports the following:

Backup basics
SERVER OPERATING SYSTEMS
▪ MVS	▪ VM
▪ OS/400	▪ VSE
▪ AIX/6000	▪ HP/UX
▪ OS/2	▪ Solaris
CLIENT OPERATING SYSTEMS
▪ NetWare	▪ Macintosh
▪ OS/2	▪ Various Unix
▪ Windows, DOS	platforms

pecially interesting when IBM follows through next year on its promise to enable data to be passed between multiple ADSM servers, Thiele said. Customers could then set up a hierarchy of central and departmental ADSM servers, giving end users "the advantage of being loosely connected and still being able to back up to a server in a place house."

Support for server hierarchies would let companies "give local departments more autonomy and authority" over storage management, Ray agreed. "It gets the enterprise people out of the game of doing day-to-day backups and restores and allows them to focus on the key corporate data."

Legent Corp. already offers server-to-server backup capabilities in its Enterprise Storage Manager software but only for connecting OS/2 systems to mainframes, said Rob Endres, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. Tiering storage servers would help distributed shops avoid network overloads that may occur if all data is backed up to a central site, he added.

The road to Cairo ends in '96, say Microsoft execs

Two top Microsoft Corp. executives — Mike Maples, executive vice president of products, and Steve Ballmer, executive vice president of sales and support — last week issued a new deadline for the arrival of Cairo, the next major release of Windows NT. It is now slated to ship by the end of 1996. Cairo will add to Windows NT an object-oriented file system, distributed networking support for Microsoft's Object Linking and Embedding technology and the Windows 95 interface.

Candle fires up visual software plans, sets June sale

Candle Corp. plans to finally ship in June a long-promised line of distributed systems management software supported by a visual programming environment. The initial Command Center release will monitor Unix systems using OS/2-based management workstations that into an MVS mainframe. More platforms will be added for other components later this year and into 1996, Candle said. The Command Center offering was supposed to have shipped in 1994 but was delayed while Candle revamped the technology and its marketing strategy, which became so confusing that "we couldn't explain it to our own sales force anymore," a company official said.

IBM targets PC outsourcing

IBM has launched an outsourcing program for large shops seeking outside help managing and upgrading their PCs. The NetWorkstation Management offering was tested in the past year by about 30 customers, including McDonnell Douglas Corp. in St. Louis and BP Chemicals in the UK, according to IBM. For an unspecified monthly fee, IBM will take over tracking of PC assets, installation of new models, help desk support, remote network management and Internet access. Both IBM and non-IBM PCs can be covered by the outsourcing service, the company said.

CA plans new database version

Computer Associates International, Inc. plans to announce the next version of its CA-Ingres relational DBMS in next month. The as-yet-unnamed product, the bulk of which will enter beta testing in the fourth quarter, will include several new features. For example, FastPath will provide users with dual access paths to data as a means of improving database performance.

Apple readies new Mac OS version

Apple Computer, Inc. is readying updated versions of the Mac OS and its QuickDraw graphics engine that reportedly boost performance by optimizing components for PowerPC-based Power Macintosh systems. The Macintosh System 7.5 Update 1.0 will offer faster file sharing, support for Drag and Drop in the Launcher, PowerTalk 1.1.1 and improved memory handling. Similarly, QuickDraw GX 1.1 will provide better font management and more printing options.

Trio to study 'telework'

Three large customers of Philadelphia-based Bell Atlantic Corp. — American Express Co., Bellcore and the Federal National Mortgage Association (Fannie Mae) — will participate in a major study of telecommuting and satellite offices at their organizations. The study will look at how "telework" affects team work, employee morale and management practices.

Microsoft bundles scheduler

Microsoft Corp. announced last week that Schedule+, its calendaring and scheduling product, will be incorporated into the Windows 95 version of the Office applications suite. Users will be able to schedule appointments and tasks through Microsoft Mail and import and export files from other applications into the contact manager. Meanwhile, Microsoft last week delivered a final beta version of the SQL Server 6.0 database to several thousand corporate users.

NextGen systems to support PCI

Systems based on NexGen, Inc.'s low-cost Pentium-class chips will now support Peripheral Component Interconnect (PCI) technology. The Milpitas, Calif.-based manufacturer last week entered into an agreement with VLSI Technology, Inc. in San Jose, Calif. VLSI will provide PCI bus and Industry Standard Architecture bus chip sets for NexGen's Nx586 processor family of fifth-generation performance x86-compatible processors.

SHORT TAKES Later this month, most of IBM's desktop and mobile systems will come standard with IBM's Select-a-System, a program that lets users choose an operating system (OS/2 Warp or DOS/Windows) simply by clicking on an icon. Users can also switch back and forth between the two environments. ... Travel Systems, Inc., a maker of distributed systems management software in Austin, Texas, last week announced an initial public offering at $14 a share; by Friday the stock had shot up to $57. ... Novell, Inc. last week announced the shipment of a GroupWise gateway for Lotus Development Corp.'s Notes. Priced at $3,495, the gateway lets GroupWise and Notes users exchange E-mail messages, tasks and schedule requests. ... FedEx Corp. last week extended its on-line package shipping and tracking services to America Online subscribers. ... Symantec Corp. last week introduced Norton Administrator for Networks 2.0. The new, more scalable version of its desktop PC management program supports centralized management of PC LANs distributed across wide-area networks.

Exchange to ship by year's end

By Suruchi Mohan

Ship dates for Microsoft Corp.'s Exchange server are slipping. Again.

Although Microsoft officials in Europe have confirmed that Exchange will not ship until at least December, U.S. officials are calling this "pessimistic."

"Our official position is that Exchange is a 1995 product, so it will ship this year," said John Frederiksen, a Microsoft product manager in Redmond, Wash. "Anyone saying mid-December is being pessimistic," he said.

"They've been kidding the public about shipping Exchange in midyear,"

said Matt Cain, program director at Meta Group, Inc. in Stamford, Conn. "Anyone doing beta knows there's more work to be done."

Indeed, Frederiksen acknowledged that the "real showstoppers" — bugs — would come with the second beta. He declined to provide the delivery date.

But while the European and U.S. offices of Microsoft try to figure out when Exchange will ship, network administrators are plugging along in their current Microsoft Mail environments. These users are trying to deal with some of the problems in Mail such as manageability, scalability and reliability while they wait for Exchange. Given past delays, few are willing to jump right in.

Exchange is Microsoft's client/server messaging infrastructure, which will provide electronic mail as well as calendaring, scheduling, workflow and database functionality. When Windows 95 ships later this year, it will work against the Exchange server.

Waiting game

"We are not jumping into Exchange," said James Ross Jackson, a staff member in the information services unit at Textron Financial Corp. in Atlanta. His company plans to move to Windows NT in the next quarter, and only after that will it look at Exchange. "I wouldn't look for it before the summer of next year," he said. If it is released before then, it will be followed by a lot of patches, he added.

Mark Buchholz, systems officer at State Street Bank & Trust in Boston, which uses a raft of mail products including Mail, is busy rolling out Hewlett-Packard Co.'s OpenMail for backbone purposes. "Exchange will be what HP [OpenMail] is today in a couple of years. Microsoft is not here today. It will be a longtime," he said.

Walker Kulecz, managing director of Technology Enterprises, Inc. in Cleveland, agreed, saying Exchange will not be ready for prime time when it does ship. "Folks who want Exchange capabilities will go to Notes," he said. He cited a client that was looking at both products and recently chose the one now on the market — Notes. Technology Enterprises is a Mail user.

Another area where Notes will emerge stronger than Exchange in the initial release is location management. This essentially allows a remote user to set up parameters, such as the order in which to replicate databases, phone numbers or credit-card numbers.

While Microsoft is not willing to publicly analyze the cause for delay in shipment, officials in Europe said some of it may be attributed to compatibility issues related to host-based legacy mail systems. Frederiksen confirmed that a large team is working on related migration and interoperability issues.

High speeds hit Interop roadway

By Laura DiDio and Patrick Dryden

Next week's Networld/Interop '95 show in Las Vegas will showcase a cornucopia of product introductions from 600 vendors, most notably in the 25M bit/sec. Asynchronous Transfer Mode (ATM) device, 100M bit/sec. "fast" Ethernet switch and remote-access device markets.

The anticipated 60,000-plus attendees can expect a plethora of low-speed 25M bit/sec. ATM offerings to boost power and extend users' investment in their installed LANs. The availability of 25M bit/sec. speeds allows closely on the heels of the ATM Forum's recent approval of the Desktop

INTEROP

ATM25 Alliance specification for low-speed ATM devices.

These 25M bit/sec. ATM are-speed switched powerhouts can use existing Ethernet and Token Ring wiring without outstripping the capabilities of the slower buses and processors of installed PCs.

Users perusing the aisles will get to view dueling "fast" Ethernet migration options from two rival camps: the 100Base-T Fast Ethernet Alliance and the 100VG AnyLAN Forum. The Fast Ethernet Alliance will feature 30 100Base-T products from 15 vendors, all interoperating.

It's everywhere you look

The Internet will be hotter than ever at the show. Vendors will introduce new or enhanced Internet access server devices and firewall software that will restrict unauthorized access to corporate networks via the Internet. Other vendors hawking their wares include the following:

● 3Com Corp. in Santa Clara, Calif., will unveil several client Integrated Services Digital Network (ISDN) products, including an Ethernet/Fiber Distributed Data Interface switching module (EFSM) and Token Ring switching module (TRSM) for its high-end LANplex 600 data center switch. The EFSM is a 16-bit Ethernet and two-port FDDI switching module. The TRSM is an eight-port Token Ring, one-port FDDI module.

3Com will also unveil an ISDN-to-dual-port asynchronous interface device that links communications servers and routers to a Basic Rate Interface line and supports central site migration to ISDN. It will list for $979.

● Larscom, Inc., also in Santa Clara, will introduce the high-speed EtherBridge, equipped with one 10Base-T port, one wide-area network port providing full 10M bit/sec. full-rate speed Ethernet throughput and Simple Network Management Protocol capabilities. Due this summer, it lists for $3,700.

Conferences galore

In addition to the product blitz from approximately 600 vendors, attendees will find a beefed-up conference schedule offering hands-on experience in a number of hot markets. The following are the five featured conferences:

● The IBM OS/2 Seminar Series '95 will feature the OS/2 Warp City Application Software Pavilion and will include 21 sessions.

● The Network Analysis Forum '95 is aimed at honing the skills of network managers via a hands-on analysis lab and one-day tutorials.

● The NetWare Users Conference sponsored by Novell, Inc. will feature a 38-course agenda.

● The Engineer Conference is targeted at software and hardware engineers and network architects who want to learn more about internetworking, network management and high-speed networking.

● The Executive Conference, sponsored by The Yankee Group, a Boston consultancy, is a two-day conference for chief executive officers and other high-level executives. It consists of 11 advanced sessions that provide case studies of the networking and systems strategy of Fortune 1,000 firms.

NT hitches ride to high end

By Stuart J. Johnston

Windows 95 will not be the only new Microsoft Corp. operating system to ship in late summer. Tandem Computers, Inc. recently announced that it will begin shipping a version of Windows NT Server for its fault-tolerant systems.

The final beta of Windows 95, called MS for "Milestone No. 8," went to manufacturing last week and is already on the way to 50,000 beta testers, said Yusuf Mehdi, a product manager at Microsoft's Personal Systems division.

The M8 beta will be followed at the end of the month by Microsoft's Preview program, which will release as many as 400,000 prerelease copies to users. Each of those copies, which will cost $32, will allow users to install Windows 95 on five machines. This means that up to 2 million units may already be installed before the product ships in August.

First to market

Despite the spotlight on Windows 95, the Tandem announcement received its share of attention. While Microsoft has had significant success in the lower end of the corporate computing market during NT's first year and a half, the company has not attracted enterprise customers because NT does not smoothly support machines with more than four processors.

Both Digital Equipment Corp. and AT&T Corp. have promised clustering for their versions of NT, but Tandem is the first vendor in the critical fault-tolerant computing market to declare it will have a version.

By September, Tandem will begin shipping its first multiprocessor, fault-tolerant NT systems based on

Mips Technologies, Inc.'s R4400 RISC processor, said Roy Graham, director and general manager of Tandem's new NT business unit. Within two years, Tandem will also offer stunning capabilities that will enable users to build large NT-based multiprocessor systems for mission-critical computing, Graham added.

Such clustered configurations could support, for example, 25 four-processor machines functioning as a single system, Graham said.

Tandem's move means that NT soon its way to making some headway in what traditionally have been two of Unix's unassailable advantages, said Rob Enderle, an analyst at Dataquest, Inc. in San Jose, Calif.

Fault tolerance and clustering "are the areas where Unix prides itself, and when NT adds those things, it completely removes those advantages [in terms of] commercial business computing," Enderle said. Combining those features with NT's hardware independence, "you get an really managed environment without any of the problems [of Unix]," he said.

"I think this is a great idea," said Colin Carpi, president of Chartwell Advisory Services, Inc. in Pena Valley, Pa. "If [Tandem] can get fault tolerance without recompiling [applications], they've got a very attractive offering." Carpi's company is building a public personal financial services network.

By adding Windows NT to its operating system offerings, Tandem will be required to introduce a new line of servers based on its current Himalaya line. The new machines will be switchable between so-called symmetrical multiprocessing and Tandem's "loosely coupled" multiprocessing, Graham said.

PowerPC: Pick your operating system

By Jaikumar Vijayan

Motorola, Inc. plans to demonstrate six different operating systems running on networked PowerPC hardware at next week's Networld/Interop '95 show.

A source at Motorola said the company will demonstrate versions of Sun Microsystems, Inc.'s Solaris, Microsoft Corp.'s Windows NT 3.51, Novell, Inc.'s NetWare, Apple Computer, Inc.'s Mac OS and IBM's AIX and OS/2 for the PowerPC. They will run on networked PowerBook systems and Big Bend evaluation systems from Motorola as well as Power Macintosh desktops from Apple.

"It is meant to serve as a demonstration of the interoperability of the platform," the source said.

For users, the porting of an increasing number of major operating systems to the PowerPC indicates growing industry support for the platform. This will result in greater availability of application software, although not anytime soon, said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

at Motorola said.

The Motorola demonstration comes at a time when IBM is preparing for a May 23 launch of desktop PCs and two notebooks based on the PowerPC 601, 603 and possibly 604 processors, according to sources at IBM. Officially, the

PowerPC Reference Platform-compliant system
Based on PowerPC 60x/6xx chips with external bus speeds of up to 66 MHz
Second-level cache selectable from among 256K bytes, 512K bytes, 1M byte
The use of ISA bus slots; three 32-bit PCI bus slots
High-performance PCI graphics
Supplied with Windows NT

would say only that the date fall within IBM's projected spring 1995 date for general availability of the products.

The new IBM desktops, which will be based on the PowerPC 601 and 604 processors, will feature standard 16M bytes of RAM, a 540M-byte hard drive, a Peripheral Component interconnect local

bus, integrated CD-ROM and business audio and high-end graphics capabilities. The pricing for the new systems will reflect that of similar systems already announced, such as Milpitas, Calif.-based Taking Advance & Technology, Inc.'s TPC-5640 and TPC-5740, scheduled to ship in the second quarter and priced from $3,500 to $4,000.

The new notebooks, which will most likely be based on the recently introduced 100-MHz 603E processor, will feature most of the same capabilities. Pricing here is also expected to mirror the current market, which is about $5,000.

The systems will be available initially with Windows NT 3.51 and AIX preinstalled. IBM's OS/2, expected to be one of the major reasons behind the delay in announcing PowerPC hardware, will ship in August, the IBM source said. OS/2 for PowerPC is currently in beta testing.

First Union banks on electronic shopping

By Thomas Hoffman

First Union Corp., the nation's ninth-largest bank, has unveiled an Internet-based electronic marketplace that will let its 10 million customers shop and bank over the World-Wide Web.

First Union's venture at Cambridge, Mass.-based Open Market, Inc. is not the first Internet-based electronic shopping channel. But the service, called Community Commerce, is being viewed as one of the most secure approaches to on-line transactions to date.

Open Market's WebServer and Secure WebServer products rely on two emerging security standards designed to encrypt data between PCs and Web servers. The standards are Secure Socket Layer from Netscape Communications Corp. and Secure Hypertext Transport Protocol, which the World Wide Web Consortium is backing:

Furthermore, the Charlotte, N.C., bank is reviewing several authentication guidelines that will prevent customers from having to pass their credit-card and/or checking account numbers over the Internet each time they purchase an item, said Jonathan Guerster, director of financial services at Open Market.

First-time buyers will have to provide their account information to First Union, which will store the data on Open Market's Integrated Commerce Environ-

ment. But once an established customer wishes to purchase a luxury item such as a Rolex watch, he may be able to use smart card technologies, which rely on an algorithm, to assure the payment and delivery of the goods without providing the number again.

"We're taking a harder road to increase security within the internet," said Tom Kitrick, a product manager for the Internet marketing team at First Union. Kitrick said that 10 to 20 merchants would be curolled on Community Commerce within the next four months.

The great equalizer

First Union is not alone in its security efforts. Last month, Wells Fargo Bank began authorizing and processing credit-card payments for Virtual Vineyards, an Internet-based business that sells wines over the Internet. Cardinal Bancshares, Inc. in Lexington, Ky., is working with Secureware, Inc. in Atlanta to develop graphical user interfaces for an Internet banking service it expects to provide this summer.

"When combined with the elimination of interstate banking barriers, electronic banking will become the great equalizer," said Richard Crone, senior manager of financial services at KPMG Peat Marwick in Los Angeles. This will place large banks, small banks and even nonbanks "on the same playing field," he said.

CompuServe buys Spry

By Ellis Booker

On hearing that H&R Block unit CompuServe, Inc. had acquired Spry, Inc. for $100 million last week, one industry watcher joked, "Dave Pool is the only man to make money on the Internet so far."

Pool is president and founder of Seattle-based Spry, an Internet access software maker. The CompuServe acquisition — which cost roughly $60 million in stock and almost $40 million in cash — was easily the Internet industry's largest to date.

Getting on the Web

More significant for users of the CompuServe Information Service will be how the Spry deal affects their ability to access the public Internet.

Currently, CompuServe users can send Internet electronic mail, conduct outbound and inbound Telnet sessions, fetch files from file transfer protocol sites and access Usenet newsgroups. But they have not been able to retain the World-Wide Web, which the addition of the Spry browser will enable them to do.

Within a month, Pool said, CompuServe will begin offering a "raw button," downloadable freeware from within WinCim, the Windows client for the CompuServe network. Users will be able to download a Winsock TCP/IP stack and a version of Spry's Web browser.

So far, only CompuServe rival Prodigy Services Co. in White Plains, N.Y., offers Web access to a subscriber's American Online, Inc. plans to give its subscribers Web access this year.

Service pricing for this Internet access will be announced at Internet World in Santa Clara, Calif., in mid-April, Pool said.

Separately last week, Spry announced Internet Office, a software bundle that includes a secure version of its Web browser Air Mosaic. The product supports the proposed Secure Hypertext Transport Protocol (SHTTP) standard, meaning it can work with any SHTTP-compliant server. Spry's own SHTTP server, SafetyWeb, was introduced earlier.

☐ **Safer electronic publishing designed.** See page 6t.

IS lacks Internet strategy

department that pushes the Internet gateway project rather than the IS team. "They've been relegated to the role of a popper."

Meanwhile, marketers are making their own rules and solving innovative, interactive techniques with tried-and-true promotional gimmicks.

"A lot of ideas proven in the past are real winners for promoting on the Internet," said Rood, chief executive officer of Dealer Internet Services Corp. in Seattle.

For Rood and other Internet businesspeople, the primary goal seems to be bringing users to their Web sites repeatedly in hopes of turning these visitors into paying shoppers. Studies have so far shown that most people cruising the Internet rarely buy anything; they just cruise for information and entertainment.

"Most companies at this stage are there to get some experience and don't expect to make this a revenue producer," said Richard Watson, an associate management professor at the University of Georgia in Athens.

Changes abound

Late last year, Watson conducted a survey of 800 Internet sites. One of his most important conclusions was that marketing people will have to change from "sending messages out" to deploying search engines and other interfaces that let customers navigate through information.

U.S. businesses do seem convinced that the Internet channel is worth an investment, even before they learn the best uses for this infrastructure. According to a survey of 1,000 chief financial officers sponsored by Hill Consulting in Menlo Park, Calif., 40% said their sales and marketing efforts stand to benefit most from "the development of advanced communications technology."

What do on-line visitors seem to desire most of all? A soft sell: the combination of constantly updated information with responsiveness on the part of the merchant.

Karen Burka, an analyst at Simba Information, Inc. in Wilton, Conn., tells the story of McDonald's interactive from McDonald's Corp., an America Online fea-

ture launched last summer. The service offers an electronic-mail facility for asking questions and leaving comments with the Rat-Ined giant.

"But the only response was an E-mail form letter saying they didn't have the resources to respond personally," Burka said.

Essential communication

Responding quickly to users' E-mail questions and complaints is essential for Brenda Goodell, vice president of programming and event marketing at Neeb-

ok International in Stoughton, Mass. Goodell is responsible for the Planet Reebok home page (http://planetreebok.com), which the company launched last December.

The Reebok home page received 350,000 hits its first week and continues to see 350,000 in 550,000 hits weekly. But the truly remarkable part of the Reebok page is how little it contains about athletic shoes.

Instead, it offers a history of the company (it celebrates its 100th anniversary this year), links to Amnesty International's home page and places to find local volunteer organizations.

"We're never going to step up our catalog on there," Goodell said.

Doing it right

Reebok is a prime example of what analysts say is the primacy of branding in cyberspace. That is, creating an entertaining, memorable place that cements a brand identity in the minds of potential shoppers.

Speaking earlier this month at the annual PC Forum in Phoenix, Adobe Systems, Inc. CEO John Warnock said the Internet was about changing economies and changing the means of communicating with customers.

"The Internet is almost a pure laissez-faire, competitive environment," he said.

X/Open plans Microsoft/Unix bridge

By Jean S. Bozman
DALLAS

The Unix industry felt the ominous rumble of Microsoft Corp.'s marketing power last week like the thunder accompanying the heavy rains here at UniForum 1995.

Most attendees at the Unix industry's largest trade show already use a combination of Unix servers and Windows desktops. And many of the 68-plus users from large corporations who attended off-site X/Open Co. meetings last week said Microsoft's ramp up of Windows NT servers is creating interoperability headaches in their information systems shops.

Although Unix vendors introduced many long-overdue unified Unix desktop here, the battle with Microsoft for the desktop has long been conceded.

"The reality is that you're going to have heterogeneous desktop environments," said Geoff Coupe, manager of open standards at Shell Petroleum International in The Hague. Coupe heads X/Open's desktop user group.

Drawing up blueprints

To bridge the Microsoft and Unix environments, X/Open is planning specifications for networked services, including naming, security and directory services, that would come to market by next year, said Mike Lambert, X/Open's chief technical officer.

These networked services will be layered over operating systems. But they will sit below the application level, where Microsoft's object request brokers will compete with those from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM.

"The key thing we have to do is to define how these open multivendor [Unix] volume markets will be integrated with other volume markets such as Windows, Macintosh and OS/2," Lambert said.

Enterprise distributed applications will require that any server — such as NT, Unix or Novell, Inc.'s NetWare — deliver electronic-mail, security and directory services to other servers as well as to clients. Yet the standards, other than the Open Software Foundation's Distributed Computing Environment and the Object Management Group's Common Object Request Broker Architecture 2.0, define how such services are delivered.

Users said there is a growing need for universal delivery of network services. Several added that Microsoft leaves the task of providing Windows-to-Unix links to third-party software companies and systems partners.

But Alain F Robert, deputy chief information officer at AT Aquitaine, one of France's largest oil companies, said users in large corporations are in dire need of products that Microsoft provide server interoperability.

"I see Microsoft supporting open systems more," said Robert, who chairs X/Open's User Council. "Maybe not because Microsoft wants to, but because the buyers want them to support open systems. For Elf, mission-critical applications will not go to a proprietary system." Elf has hundreds of Unix servers and 25,000 Windows-based PCs.

Bob Kruger, Microsoft's director of technology markets and standards, said he is open to the idea of supporting X/Open interoperability standards.

"Both sides have to firm up their ideas," said Kruger, who is Microsoft's representative on the X/Open Independent Software Vendor Council.

Open network services would enable delivery of Microsoft's Cairo objects and Object Linking and Embedding messages to widely installed Unix servers.

"If Microsoft wants to have an enterprise computing strategy, they have to interoperate with what is already there," said Nina Lytton, president of Open Systems Advisors in Boston.

Sun stretches **Solaris** at high and low ends. See page 47.

Expo peeks at future of object-oriented development

By Elizabeth Heichler
BOSTON

If tools making their debut at this week's Object World represent the future of object-oriented development, software developers building C++ applications may soon spend more time assembling prebuilt components than actually writing code.

For example, IBM will finally announce its much-heralded Visual-Age C++, which combines the visual builder from its VisualAge for Smalltalk product with its C++ development tools. And Cadre Technologies, Inc. will introduce the ObjectTeam Application Factory, specifically aimed at developing reusable software components and assembling applications based on those components.

The tools reflect the future of programming as seen by some developers, such as Steve Gardner, president of Cyberworks Corp. in Fort Worth, Texas. Previously a

corporate developer, Gardner said a lack of highly skilled programmers who can work directly with object-oriented languages will drive companies to employ less-skilled applications builders who understand how to assemble prefab code blocks.

"Those products will make it much easier to work with C++," said Mitch Kramer, an analyst at Patricia Seybold Group in Boston.

IBM's decision to move the visual builder tool from its Smalltalk product into the C++ realm is sensible in light of another trend Kramer has observed. He said a C++ is gaining momentum and starting to rival Smalltalk as the basis for commercial, rather than technical, applications developed with object technology.

With VisualAge C++, IBM is delivering enhancements to the visual builder and the underlying C++ development tools, according to Tim Negris, IBM's vice president of marketing for application develop-

ment. The tool set will run on OS/2 2.11 and OS/2 Warp, he added.

Developers using IBM's C++ tools in the area of database access and manipulation will soon be able to map database meta-data directly to objects and generate the complete SQL code necessary to create database objects, Negris said.

Twice as nice

Gardner is a beta user of Visual-Age C++ and views it as the "best of both worlds — you can use the visual builder from their Smalltalk product and generate C++ code." While the Smalltalk world has offered easy-to-use development tools such as VisualAge, the applications do not run as well as C++ applications in production environments, he said.

Meanwhile, Cadre's launch of its ObjectTeam Application Factory brings the computer-aided software engineering vendor, which has focused on analysis and design tools, squarely into the construction and coding market. Kra-

"This is the first release of a tool that offers more potential than it delivers in the first release," Kramer said. While he raises its easy access to relational database services as "really important," Kramer added he hopes Cadre will offer access to other services such as object request brokers, transaction processing monitors and Microsoft Corp.'s Object Linking and Embedding.

Priced from $4,495, ObjectTeam Application Factory runs on Microsoft's Windows 3.1 and Windows NT and consists of the following three modules:

• WireShop, which provides mechanisms for linking application logic components to graphical user interfaces.
• ComponentShop, which provides component catalogs and code-generation facilities for constructing C++ components.
• DraftShop, which provides component design editors and code-generation facilities for constructing C++ components.

◆ Mercedes-Benz develops object-oriented system. See page 67.

Taligent ships CommonPoint beta

By Lisa Picarille

Components, Objects, Plug and Play. Reusable code. Taligent, Inc. intends to provide the attendees of this week's Object World show in Boston with more than the recommended daily allowance of buzzwords.

After three years and more than an estimated $90 million, Taligent will outline its progress on and announce shipment of the final beta release of its Common-Point application system to its high-profile investors — IBM, Apple Computer, Inc. and Hewlett-Packard Co.

CommonPoint is Taligent's operating-system-independent environment of object-oriented frameworks that streamline and accelerate application development. It offers both common system functionality — networking and data access — and common application capabilities — two- and three-dimensional graphics and multimedia.

The beta release of CommonPoint includes more than 100 frameworks, according to Stratton Cleeves, Taligent's vice president of worldwide marketing and sales. These frameworks reportedly will also enable corporate and third-party developers to more quickly create portable enterprisewide applications.

For users, this translates into software that is task-centered, erases boundaries between applications and fosters a more free-flowing method of interacting with several resources.

"CommonPoint is the first big thing that has the potential to win the component wars because it is complete in its

functionality and not just another GUI builder," said Randall Pisel, president of Sundial Systems Corp., a Seal Beach, Calif., CommonPoint beta tester and developer of time management software.

All that and more

The final CommonPoint 1.0 reference release, due this summer, will include the CommonPoint application programming interfaces that enable IBM and HP to optimize the frameworks to run on their specific operating systems. Analysts estimate that will happen about 60 to 90 days following the CommonPoint 1.0 reference release.

But because CommonPoint requires a 32-bit host, frameworks for the Macintosh will not be available until mid-1996 when Apple ships System 8, code-named Copland, said Hugh Bishop, manager of emerging technology research at Aberdeen Group in Boston.

This week Taligent is also expected to announce its high-profile beta-to-building graphical user interfaces and front ends.

Despite early praise from industry observers and beta testers, some users are adopting a wait-and-see attitude.

"I think OpenDoc, Taligent and [Object Linking and Embedding] are going for the same space, and it's not clear which approach is better," said Mike Bailey, an IS network manager responsible for 140 Macintoshes at Lockheed Martin's Missile Systems division in Sunnyvale, Calif.

◆ Languages, methodology are key to object-oriented development. See page 73.

Survey finds computer fraud often an inside job

By Julia King

Companies frequently need to look no further than their own information systems organization for likely perpetrators of computer fraud and sabotage.

So concludes a recent survey of more than 200 programmers, analysts and others in professionals from nine Ohio-based manufacturing and service companies. Conducted by Susan Harrington, a professor of IS at Georgia College in Milledgeville, the survey found the following:

• 41% of IS employees would illegally copy software for their own use or for a friend.
• 7% of IS workers would adjust a bank account system to avoid incurring a service charge.
• 10% of IS workers saw nothing wrong with writing a virus program to output the message "Have a nice day."

Even though the percentages of workers who would commit such abuses are low, they are significant "because there is an incremental aspect to crime," Harrington said last week. "If becomes a little more addictive as the challenge of it grows."

Moreover, to have even a small percentage of employees amenable to computer abuses suggests that virtually all IS managers may be vulnerable to security problems from their own IS employees, she noted.

Harrington's survey also found a link

between workers with a low sense of responsibility and those who would commit computer fraud.

"These are people who tend to rationalize. They are the people who say that since the company hasn't set up a security system to keep me out, it is OK to get in," Harrington said.

Standard defense

M. E. Kabay, director of education at the National Computer Security Association in Carlisle, Pa., is familiar with this syndrome, which he calls the "video game defense."

"Children who grew up playing video games seem to believe that anything that the game allows is okay," Kabay said. In the workplace, this defense translates in such a way that "if you try and get away with it, it must be OK."

To prevent such abuses, both Kabay and Harrington recommend that companies aggressively launch much stronger education and training programs that instruct workers on the real consequences of what they think are superficial pranks.

"In many cases, management itself hasn't grasped the true value of the information resource and therefore has skimped on awareness and training programs," Kabay said.

The bottom line, he said, "is that there is no such thing as a harmless, effective intrusion into a production computer system."

Spend

less.

Worry

less.

Search engines accelerate Internet browsing

By Ellis Booker

Heard above the rushing sound of half a million people joining the Internet each month is the rising lament, "Where the &%#@!& do I find . . . ?"

While browser tools such as Mosaic have brought unprecedented numbers of new users to the Internet, the lack of any thing resembling a central index means many of them are promptly lost once they get there.

Even when Internet surfers hit the right server, another difficulty is figuring out how to search for and find a particular item.

All of this poses a problem for users but presents an opportunity for service providers (see story this page). In response, several firms are repositioning their full-text search engines to make unmanaged content more manageable.

This week, Fulcrum Technologies, Inc. in Ottawa is expected to unveil Surfboard, a search and retrieval server engine based on Fulcrum's SearchServer but optimized for the Internet.

Client applications such as Mosaic take users to servers that may already be equipped with search facilities. The client application then acts as the interface to the full-text search application.

Surfboard databases can be accessed by major Internet World-Wide Web browsers as well as other standard Internet clients. The product is said to support all major document formats, from Hyper-Text Markup Language, Internet News and electronic mail to major word-processor formats and ASCII text.

Surfboard is scheduled to ship in May at a starting price of $15,000.

Jay Batson, a senior analyst in the Network Strategy Service at Forrester Research, Inc. in Cambridge, Mass., said virtually every vendor with a LAN-based, full-text search engine either has announced or is planning an Internet server product.

Still, Batson said he wonders whether these relatively expensive full-text search engines will address a large market. "Not all information lends itself to that sort of [interface]," he said, suggesting that instead of full-text search, content providers may want to redesign their systems around other navigational approaches such as interactive forms.

Last week, Encyclopaedia Britannica, Inc. in Chicago and Wide Area Information Servers, Inc. in Menlo Park, Calif., announced plans to jointly market an enhanced version of the Wide Area Information System search engine developed by Encyclopaedia Britannica's Advanced Technology Group.

Finally, Verity, Inc. in Mountain View, Calif., will join the fray on April 15 with the announcement of Topic Information Server for the World-Wide Web. The server-based search engine, which will include native support for Adobe Systems, Inc.'s Acrobat indexes, is expected to have a base price of $7,995.

Netscape to Yahoo

Yahoo, a searchable inventory of more than 30,000 entries, is emerging as one of the Internet's most popular destinations.

The year-old Yahoo was created by David Filo and Jerry Yang, both Stanford University doctoral engineering students who now operate the resource out of the Mountain View, Calif., offices of Netscape Communications Corp.

Clicking the Net Search button on the Netscape Navigator tool bar brings users to the Yahoo directory (http://www.yahoo.com). The server is receiving roughly 3 million hits per day, which represents perhaps 500,000 users.

Others want to create fee-based directory tools such as the InfoSeek Search on-line subscription-based service, which was introduced last month at a price of $9.95 per month. — Ellis Booker

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OUGH TO GET ON THE INTERNET?

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AT&T GIS eases remote office automation

Virtual Workplace offers one-stop shopping but restricts users to one vendor

By Neal Weinberg and Michael Fitzgerald

One-stop shopping might be heaven to some consumers, but for corporate notebook buyers it smacks of being tied to a single vendor.

This could be a problem for AT&T Global Information Solutions, which leveraged ties in parent company AT&T Corp. to develop Virtual Workplace — an innovative mobile marketing program announced two weeks ago.

The idea is to provide the hardware, software, training and services that companies need to help set up the complex systems required to automate a field staff.

To participate in the Virtual Work-

place program, users dial a number to reach an authorized reseller who puts together a package consisting primarily of AT&T products.

The offerings include the following:

■ Notebooks and mobile accessories such as printers and portable CD-ROM players.

■ Phones such as fax/modems and cellular phones.

■ Services such as remote voice mail and electronic messaging.

■ Client/server software, including Xcellenet, Inc.'s RemoteWare, Brock Control Systems, Inc.'s TakeControl sales force automation package and Adaptive Strategies' MobileSync.

■ Support services for remote users who have trouble with the equipment.

The products are distributed through resellers, including MicroAge, Inc. and Inacom Corp.

While analysts said AT&T GIS has gone a step beyond its competition in offering a more comprehensive combination of products and services, it might not help the company in the market.

"This is a wonderful sales idea, but their notebooks just haven't caught on in the market and just simply saying, 'Isn't this a great service program?' doesn't make it with the corporate buyer," said Michael McGuire, an analyst at Dataquest, Inc. in San Jose, Calif.

At least one user agreed.

"I never feel comfortable getting too locked into one vendor," said Jim Menneely, programming manager at Progressive Insurance Co. in Mayfield Village, Ohio.

High level of integration

On the plus side, "no vendor has really stepped up to the level of integration AT&T GIS is shooting for," said Chris Goodhue, a research director at Gartner Group, Inc. in Stamford, Conn.

Still, the program could appeal to users with new mobile projects. For instance, when Boston-based ITT Sheraton Corp. decided to double its sales staff from 35 to 70 and fan people out across the country, AT&T GIS set up the system, including notebooks, cellular phones, training and service [CW, Jan. 16]. Previously, ITT Sheraton's sales force was largely unautomated.

Giving users that kind of complete package does not AT&T GIS' effort apart, said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. However, the company must overcome uncertainty from customers as well as competition from a multitude of companies that use rival long-distance phone service, hardware or software that AT&T does not support, he added.

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Brainshare conference

Novell to recharge core business

By Laura DiDio

SALT LAKE CITY

Renewed momentum will be the cause of the game at the Novell, Inc. Brainshare developers conference here this week.

Novell will use the conference to demonstrate that the company is back on track with its core network operating systems business. In the past two years, the Orem, Utah, company has acquired at least 20 companies, and some users claim that has caused it to lose focus and delay some NetWare 4.x enhancements.

The cornucopia of technology enhancements expected at the conference is intended to quell such criticisms and underscore Novell's continued commitment to its NetWare network operating system. For example, new features will include several long-awaited capabilities for NetWare 4.1, including symmetrical multiprocessing (SMP), an Advanced Client Services application programming interface, a Netscape browser for the Internet and AT&T Corp. NetWare Connect services, said Novell President and Chief Executive Officer Robert Frankenberg in an interview last week.

SMP due out this spring will provide large users with a "stunning increase in performance," Frankenberg said. The Advanced Client Services will provide a customizable interactive graphical interface to the network.

Frankenberg said these features will ship this year but did not say when.

Most important, the announcements and demonstrations are intended to win the confidence of users and developers.

"I've seen some of the products, and I'm satisfied that Novell is on track and moving forward," said Dan Kohnke, corporate network planning coordinator at the University of Texas M. D. Anderson Cancer Center in Houston.

Kohner said that last year Novell "got sidetracked and spread itself too thin." At the facility, Novell's lack of focus in 1994 meant a slew of reliability problems with NetWare 4.01. At one point the upgrade from 4.01 to 4.1 was halted due to the number of bugs, Kohner said.

Mixed reviews

Developer Marc Parkel, president of Computer Tyme, Inc. in Springfield, Mo., touted Novell's efforts to speed up enhancements to the NetWare 4.1 platform. But "I'm still frustrated by the fact that I can't access [NetWare Directory Services] from MS-DOS," he said.

But Jesus Rodriguez, director of information technologies at Unified School District in Tucson, Ariz., lost patience with Novell's lack of direction and switched to Microsoft Corp.'s Windows NT Server.

"We didn't like NetWare 4.0. What a piece of junk," Rodriguez said. "We didn't even want to open the 4.1 box."

"Thank God Bob Frankenberg is at the helm," said Richard Buchanan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "I think Novell will make a lot of strategic alliances. The company has a one-year window of opportunity to push [NetWare Directory Services] into the installed base and make it a de facto standard."

Frankenberg sets goals for Year 2

Super NOS, product enhancements will roll out

By Laura DiDio

A year after taking over the top spot at Novell, Inc. from founder Ray Noorda, Robert Frankenberg is forging ahead with his vision of "pervasive computing."

The vision included extending NetWare's dominance beyond mere file and print services and into the realm of distributed client/server computing.

In an interview last week, Frankenberg said he spent his first year at Novell "eliminating a number of the product initiatives that caused us to lose focus — like Novell DOS, the Unixware Database and the AppWare Foundation." (See story page 1.)

On the horizon

With the major streamlining efforts behind it, Novell is ready to face its next set of hurdles. These include the following:

- Delivering components for the as yet unshipped Super NOS, the combined NetWare and Unix platform.
- Gaining interoperability with Microsoft Corp. product suites, such as connectors for Windows NT and Windows 95.
- Bolstering the capabilities of NetWare Directory Services.

Novell CEO Robert Frankenberg: Interoperability with Microsoft products isn't a hurdle

- Further enhancing NetWare 4.1 with telephony services.

Novell, Frankenberg said, is actually delivering some pieces of Super NOS already. "We're rolling out Super NOS in a phased manner. So far, we've delivered a common protocol stack and common set of [Open Data-link Interface] drivers for NetWare 4.1 and UnixWare 2.0," he said. "Next we'll deliver common clustering and management capabilities for NetWare and Unix-Ware. In its final phase, Super NOS will deliver a common source code and high-availability integrated with NetWare this year. These capabilities will let users route calls and redistribute them.

Frankenberg also claimed that several key performance advantages in NetWare will blunt the advances of Windows NT Server. "NT Server still doesn't have some of the baseline capabilities of NetWare 4.1 like 'lights out' operating — the ability to run and manage a system remotely or the ability to do remote archiving without having the tape drives manned," he said.

Novell will also unveil telephony capabilities integrated with NetWare this year. These capabilities will let users route calls and redistribute them.

AppWare

CONTINUED FROM PAGE 1

tion programming interface operating system for cross-platform connectivity; the other was Visual AppBuilder, a fifth-generation language (5GL) object-oriented programming environment, Spiegel said.

Novell killed AppWare Foundation last fall after it failed to garner widespread support from independent software vendors (ISV). It was the right decision, Spiegel said. "There was no way they could go head to head with Microsoft."

Meanwhile, the rest of the initiative — Visual AppBuilder and Application Loadable Modules (ALM) — has continued to evolve, Frangen said.

This chunk of AppWare, he said, will let power users quickly develop customized applications, a capability that will be crucial as users implement true distributed client/server networks. But Novell has not detailed this capability. Without App-Ware Foundation, Visual AppBuilder is just a graphical 5GL tool for linking applications.

Programmers have several options, Spiegel said: They can use development tools such as Microsoft Corp.'s Win32 API or the multivendor OpenDoc framework supported by Apple Computer, Inc., Novell and others, or they can use existing development tools to jump-start their own cross-platform application development efforts.

Firmage declined to provide specifics but promised that ALMs and the Visual App-Builder tool will be demonstrated at Brainshare. They will allow users to construct applications using graphics and objects rather than traditional lines of code.

"It's alive, it's dead, it's alive again. I don't have a sense of what AppWare is, and I don't know if the developers [do] either," said Lee Doyle, an analyst at International Data Corp.

in Framingham, Mass. "The real problem with App-Ware is that Novell now has to undo the damage caused by a year of uncertainty. Many developers are clearly unhappy about belying whipsawed by Novell."

Indeed, revitalizing AppWare will be a Herculean task. Because NetWare Loadable Modules are difficult to develop, Novell has not been able to win a wide base of application developers.

And given App-Ware's history, users and analysts are skeptical Novell can deliver a cohesive application development plan.

"We've wanted to see an applications strategy from Novell since last year," said Steve Austin, MIS manager at Reliospter Support, Inc. in Oregon, Conn. "It's frustrating and disappointing that it's taken them so long."

And if "Novell doesn't have applications or database server solutions, someone else will. The door is definitely open for [Microsoft's Windows] NT Server to gain a foothold here," Austin said.

Tom Kocharny, president of Summit Strategies, Inc. in Boston, reacted to the news of the upcoming AppWare initiative with an emphatic "Oh, no! Not again."

"It's too late for Novell to establish Net-Ware as a viable applications server platform via AppWare. They tried to out-Microsoft Novell and simply failed to deliver on their AppWare API promises two years ago," Kocharny said.

Even so, not everyone was downbeat on AppWare's prospects of success.

"I'm still bullish on AppWare," Spiegel said. "It's extremely easy and very object-oriented. The key to AppWare's success rests with the ALMs and Novell's ability to get a lot of ISVs to write to it. Novell will have to deliver and deliver well."

Senior editor William Brandel contributed to this report.

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WHERE DO YOU WANT TO GO TODAY?™

Informix readies new products

Pure object-oriented database to ship in fourth quarter

By Kim S. Nash

Informix is expected to be the first of the major relational database makers to ship a pure object-oriented database.

The company plans to deliver an object database as a repository embedded in New Era 2.0, an upgrade to Informix's development tool kit due out in the fourth quarter, Chief Executive Officer Phil White said. New Era 1.2 — an interim release due in July — is expected to spout application partitioning capabilities and a link to Sybase.

On the database side, On-Line is due to move up and down during the next year. Phase for OnLine 8, a major upgrade to OnLine 7.1, will include support of massively parallel processing (MPP) computers from AT&T Corp., IBM and ICL. OnLine 8 is due out in the second half of 1995; other MPP platforms are slated for early 1996.

Pushing On-Line down to the workgroup level impinges on territory already occupied by SE, Informix's "other" database. SE is a popular low-end product among vendors of retail and some

Informix CEO Phil White says he would like SE users to migrate to OnLine

niche applications that embed the database into their packages. Where does this leave owners of the 400,000 to 500,000 SE licenses?

"We will want to see current corporate SE users migrate to OnLine and save SE for the client," White said.

SE will not receive replication, parallel and other sophisticated features contained in OnLine, he confirmed. During the next year, in fact, the low-end database will go even lower: SE will be Informix's single-user database aimed mainly at developers, he said.

Informix does not expect sales figures for its different product lines, but "SE growth has been relatively flat," acknowledged Howard Graham, Informix's chief financial officer, to a group of financial analysts last month.

Reaching out to users

Informix, two high-profile deals that Informix wrangled last year have paid off. SAP AG shipped a version of its hot R/3 accounting suite on the Informix OnLine database last year.

PeopleSoft, Inc. followed with an OnLine port of its Financials modules a month later.

The bulk of the business still comes from Oracle users, but SAP estimates that 30% of new installations of its R/3 application base come with an Informix OnLine. That is up from nearly OnLine, That is up from zero a year ago. As of Jan. 1, 275 SAP customers were running R/3 on OnLine, he said.

And at the result of People-Soft applications deals, Informix has negotiated nine new contracts worth more than $5 million in licensing fees, the companies said.

— Kim S. Nash

Informix

Few observers said they expect Informix to overtake Sybase's No. 2 market share slot or knock Oracle Corp. out of its leading position. Yet Informix has carved inroads at several key user sites, including the $2 billion mining company Freeport McMoran, Inc. and the $9 billion Home Depot retailer.

To compete with the heavyweights, Informix spent the past four years bulking up its OnLine database and tools. And 1995 is the year that effort will either pay off or peter out, according to more than 10 users and analysts interviewed by Computerworld.

Even so, the Menlo Park, Calif. company has made life rougher on itself than it had to, said Rich Edwards, an analyst at Robertson, Stephens & Co., a San Francisco brokerage firm.

From scratch

Informix has consistently chosen to build new technology fresh, rather than redesign older products in baby steps that would not disrupt existing customers, Edwards said. For example, Informix opted in 1992 to build an object-oriented client/server development tool from scratch rather than tack new features onto its existing fourth-generation language. Today, the vendor faces an installed base of 4GL users with no convenient migration path to the 5-month-old New Era tool.

Unrepentant, Chief Executive Officer Phil White stands by his ground-even-up approach. "There's no shortcut to good development," White said in an interview last week. "You have to be careful about doing interim things that don't lead you anywhere after you get them built."

Holding on

According to International Data Corp. in Framingham, Mass., the 1994 worldwide relational database market was worth $1.05 billion. Informix held 13% of the market, coming in third behind Oracle with 35.4% and Sybase with 16.3%.

Meanwhile, New Era has turned heads at American Express Co., Clorox Co., McCaw Cellular Communications, Inc. and other large user sites that had previously bypassed Informix.

However, relatively weak third-party support has discouraged some potential customers, said Rich Finkelstein, an analyst at Performance Computing in Chicago.

Most independent software vendors that make report writers, manufacturing applications, systems management utilities and the like port their packages to Oracle first, then Sybase, Finkelstein said. Informix is a distant third, and some suppliers never bother with an Informix port at all.

Informix has been an afterthought for top applications software companies. White acknowledged. "But we're starting to win them over," he said (see story top right).

To win corporate hearts, White has taken to calling on potential customers in person to convey exactly what his firm can do for them. In a market where the leaders play technology leapfrog every nine to 12 months, the touchy-feely stuff counts, said Jeff Huge, director of data architecture at the travelers check division at American Express.

"You can do an evaluation [of products] now, and three months later, it's invalid," Huge said. "I like the personal approach, and I guess Informix does, too."

Feature-for-feature equality is not good enough for a come-from-behind player, said Ron Griffin, chief information officer at Home Depot in Atlanta. "Informix can't grow with technology that just does what all the other guys do. It has to separate them in almost every way," he said.

Late last year, the 230-store, fix-it supply chain signed

a multimillion contract with Informix after contemplating a switch to Sybase or Oracle, Griffin said.

"Informix's direction is consistent with ours," he said, referring to the vendor's plans to support massively parallel machines this year (see story top left).

But not too long ago, some OnLine users wondered whether Informix was going anywhere at all. In 1991, Informix decided to gut its OnLine 5.0 relational database and start anew with a better architecture. The move angered some customers who though Informix simply slapped together OnLine 6.0 hastily and poured its real engineering talent into the 7.0 generation. In fact, even today, more Informix customers run Version 5.0 than 6.0.

But OnLine 7.1, which shipped last year, is regarded as perhaps the best parallel processing database out there, according to former Greg, Inc. and other consulting firms. Oracle addresses parallelism differently than Informix; Sybase has promised strong parallel features for its forthcoming System 11 database, which is due to start beta testing this year.

"Informix had the better architecture by far," said Howard Fischer, senior product manager for database services at Sears Merchandise Group in Hoffman Estates, Ill. The unit handles information systems functions for the retailer.

Sears has started migrating inventory, logistics, customer services and other large mainframe applications to OnLine running on IBM RS/6000 servers.

Looking for a corporate downsizing standard, Sears pitted Informix OnLine against Oracle in mid-1994. Sears was impressed with OnLine, but a few personal visits from White clinched the deal, said Bob Check, director of development support at Sears Merchandise Group.

Computer Industry

Tech sales rise

Global sales of U.S. electronics products rose to a record $588.7 billion in 1994, up from $341.7 billion the year before, according to the American Electronics Association. New orders kept pace with sales for the first time since 1988, with a book-to-bill ratio of 1.0.

Network to buy NRC

Fish maker Network, in in Irving, Texas, said it will buy Network Resources Corp. (NRC), an Ethernet switch and router vendor in San Jose, Calif. Network will trade up to 2.75 million shares of its stock and $4 million in cash for all outstanding NRC stock.

3Com posts record

3Com Corp. in Santa Clara, Calif., announced record revenue of $356.7 million for the third quarter, an increase of 56% over the same quarter last year. Profits increased 55% to $45.5 million for the quarter, compared with $34 million last year.

SHORT TAKES BRG Corp., a Houston-based computer services company, has organized its education and consulting business units into a subsidiary operating unit called BRG Alliance/IT, Inc. . . . Daniel L. Palmer has been named president and chief operating officer of Digital Link Corp. in Sunnyvale, Calif. . . . Bob Bennett and Newman, Inc. acquired it will buy the B.R.Ass Interest service from the Southeastern Universities Research Association. . . . Robert F. Lee, president and chief executive officer of Insignia Solutions in Mountain View, Calif., has been appointed chairman. . . . Circuit maker AMP, Inc. has agreed to acquire M/A-Com, Inc. for $227 million in a bid to boost its presence in the wireless components market. . . . David White has been appointed chief operating officer at Louisville, Colo.-based Storage Technology Corp.

Ruling puts ball in Borland's court
Attention turns to fixing up company

By William Brandel

Something finally went right for Borland International, Inc. this year.

Two weeks ago, the U.S. Court of Appeals for the First Circuit reversed a lower court decision that determined Quattro and Quattro Pro — spreadsheet products developed and formerly marketed by Borland — infringed on Lotus Development Corp.'s copyright of the 1-2-3 spreadsheet.

Borland's fiscal year

1994 revenue 1995 revenue

$535M $246.6M

-$51M   -$86.2M
1994 loss   1995 loss

Source: IBS Securities, Inc., New York

But that victory will not help Borland regain market dominance in databases. Nor will it change application buying patterns in the market. The win also will not suddenly make Borland profitable, despite removing the specter of a possible $100 million payment of damages to Lotus.

However, for the folks at Borland, the ruling was like having a time bomb removed from the bottom of a car that was already in need of repair.

"What we're seeing is that a cloud of uncertainty over Borland has been removed from our base business," said David Watkins, vice president of marketing and support at Borland. He said the ruling will make Borland's business partners more confident in the company's ability to remain in business.

Novell, Inc., which bought Quattro Pro and uses it along with Paradox in its PerfectOffice application suite, had no comment on the ruling.

- Laid off 950 of its 2,200 workers.
- Seen the leadership of the company change hands three times.
- Lost more than $70 million on estimated revenue of $246.6 million (see chart).
- Sold off a major line of business — the Quattro Pro spreadsheet.
- Revamped its business focus away from applications and users to tools and developers.

"This ruling is a huge positive for Borland," said Michael Wallace, an analyst at UBS Securities, Inc., an investment bank in New York. "Now they won't suddenly get a ruling that will break the company. In other words, they can just worry about fixing up the business."

And there is much fixing to do. Wallace said he expects Borland to pull in $220 million in revenue for fiscal 1996 — 11% less than the estimated $247 million in revenue for the fiscal year ending March 31, 1995. Sales of flagship products dBase and Paradox have not lived up to expectations. And although Borland's new Delphi client/server development tool is expected to pull in $35 million in revenue for fiscal 1996, according to Wallace, the tool alone cannot save the company. What will remains unclear.

Meanwhile, the company's cash position is weakened as well. It now has almost $60 million in cash, down from the $94 million it held at the end of its third quarter, which closed Dec. 31, 1994.

Wild ride

Borland has now capped off one of the most tumultuous 12-month periods endured by any vendor in computer industry history. In the past year, the company has done the following:

D&B Software taps Scherb to steer tech helm

By Rosemary Cafasso

Continuing the corporate revamp it began last year, Dun & Bradstreet Software last week named Jeff Scherb, a former information systems executive at Turner Broadcasting System, Inc., as chief technology officer.

The post had been vacant since John Landry, now a senior vice president at Lotus Development Corp. in Cambridge, Mass., left D&B Software more than three years ago.

Industry analysts said the addition of Scherb should boost the Atlanta-based software company, which is struggling to gain ground in the cli-

D&B Software's new technology chief Jeff Scherb plans organizational tuneup phase

ent/server applications arena. Scherb's charter is to focus exclusively on client/server technologies. The company also has 10,000 mainframe customers.

D&B Software, which sells the Smartstream suite of applications, has been outgunned and outpaced by rivals such as SAP America, Inc. and Oracle Corp. D&B Software appointed Doug MacIntyre as chief executive officer last year to help give the company a better focus.

"Since Landry left, it was hard to tell who was steering the technology ship," said Ed Black, an analyst at Aberdeen Group in Boston.

D&B Software has essentially executed its original cli-

ent/server plan, but it has taken longer than expected and now it is time to bring on new technology leadership, Black added.

Scherb was a vice president of systems development for worldwide information technology services at Turner. Prior to that, he was a vice president at the former Cullinet Software, Inc., now a part of Computer Associates International, Inc.

One more on the list

The chief technology officer's arrival at D&B Software is the latest in a series of executive appointments quietly made by MacIntyre since he joined the company as CEO in July 1994.

In an interview last week, Scherb said his short-term objective is to tune up the development organization before taking a more active, public role.

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It's déjà vu. You've been here before.

The hardware is different. The systems are different. But the problems look awfully familiar. Operations management, resource management, storage management, configuration management, application management, problem management. Doesn't some of this stuff go back to Univac II? And yet, here you are at square one, spending way too much time on the most mundane part of your job. If only there was some management software out there that actually helped. Well, actually, there is. At Legent, we've put together the most extensive set of industrial-strength, distributed systems management tools available. We've also developed an open architecture called XPE that, according to some of the toughest analysts in the business, is pretty remarkable. As a result, our software works together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX servers to PC LANs. Which means you can manage your systems from the platform of your choice, something our customers tell us has definitely made their lives easier. Think of it: systems management tools that really work. It's déjà vu all over again.

Captains courageous

Imagine a CEO, maybe yours, rolling up his sleeves and getting his hands filthy dirty with computer technology, plainly— if not proudly —displaying the glories of the most rudimentary PC functions.

Now imagine him doing this in full view of dozens of other CEOs, all hosting and pecking their way to some greater understanding of the machines and technology for which American CEOs will shell out $200 billion this year.

That was the scene two weeks ago at a CEO boot camp — the fifth such session hosted by Computer Associates International. About 50 CEOs shelled out $6,000 apiece to let their hair down in a most uncharacteristic way

The greater detail of the retreat was not computer literacy but shattering long-standing communication barriers between CEOs and the information systems leaders of their organizations.

To me, the fact that these CEOs, and the 250 who had attended before them, came into an arcane environment of keyboards and IS shoptalk is proof of their desire to connect to you and your world. To many of them, this world remains a distant, mysterious place they'd much rather avoid.

One executive told me, "I just want to be able to talk to these [IS] people and not feel snowed. I've never been an engineer, but I can talk to my engineering group just fine. The computer people have always been different."

Over lunch or drinks, they discussed their frustrations about getting straight answers on how new systems expenditures would benefit the business and its customers. They also talked about their failure to clearly articulate business goals and the corporate mission to IS. There's a strong desire to change, to bridge the communication gap once and for all.

Nestled beneath a curiosity and fascination about information technology, the CEOs sat at rapt attention for 90 minutes — before dinner — as cult figure Jaron Lanier wrestled with his 2-foot-long dreadlocks while he guided them through the future of virtual reality. And they had a ball playing with their laptops (which were take-home items, by the way).

They paid a lot and traveled a long way for this experience. Why? Is it because they needed the security of others like themselves not to feel stupid or ashamed? How could a vendor make your boss feel more comfortable with computer technology than he can feel in the sanctity of his own office?

No matter. The key point is that many of these corporate captains are trying to reach out to IS and are willing to show their vulnerabilities. They had the hesitation of children when they saw their screens snap to attention at the command of the mouse. Maybe you should think of the CEO as a big kid bursting with curiosity about your world. Be just needs to be more secure about exploring it.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: blaberis@cw.com

Paperless vision no threat to forms

Predictions of the paperless office and the impending demise of the forms industry surfaced in "Paper chase" [CW, Feb. 6].

I agree that electronic and digital technology has replaced many paper tools in the workplace. That is why the forms and systems industry is playing an increasingly important role in the emerging $25 billion information management arena.

Having established direct and ongoing customer relationships over many years, the industry serves as an objective analyst of business problems and a consultative partner with its customers. This positioning has allowed the industry to focus on its core competency: simplifying workflow to create competitive advantages.

The article pretends to have "discovered" a trend away from paper-based business documents. Let me assure you that the forms and systems industry is ready with products, processes and services to meet today's information management challenge.

Christopher R. Severino
President, Executive Director
The IBFI Foundation
Arlington, Va.

Bugs expected in prerelease version

In your article "Action integrates workflow, document management" [Feb. 6], I am quoted regarding some minor problems with the Action document management integration.

Associations must keep up with times

Regarding "Associations fight against declining memberships" [CW, Feb. 13], I believe, associations were late to understand the changing technical environment and were filled with bureaucracy and "good ol' boy" networks.

As a member of the Data Processing Management Association for more than 10 years, I truly believe association membership is beneficial for the interaction it fosters. There are many great people and ideas I would have missed had I not been a member.

Associations have to understand that most new members will come not from the "big iron" environment, but from the service environment — not necessarily "techies" but people interested in learning how technology is used by others and how it could help them.

Alex H. Kelso
Nashville

My conversation with your reporter emphasized our overall satisfaction with the integration. I stressed efficiencies gained and cost savings realized through the integration of workflow and document management processes. The overall tone of our conversation was extremely positive.

I told your reporter that our experience was with a prerelease version. As with any early release version, there were some minor problems. Identifying and resolving these issues is the reason for a limited early release program.

Jeffrey J. Peterman
President
Green Pasture Software, Inc.
Corvallis, Ore.

Managing recipe

Regarding "Dictatorship 'insures' CIO's turnaround plan" [CW, Feb. 6], surely we are not to believe that the Neanderthal style of management where a dictatorial megalomaniac ensures that browbeating his people into performing compassionate tasks is a recipe for success in any business? Have we learned nothing about business and people in the past 50 years?

The types of problems discussed in the article point to a history of management problems. These problems can be dealt with in many ways, including quality management techniques, re-engineering or, simply, solid management and leadership. The solution to poor management is to replace it with good management — not to absolute the entire populace.

Christopher R. Trower
President
CRT, Inc.
Rochester, N.Y.

The burden of IS's dysfunctional staffers

Thornton A. May

Most of the 4 million individuals employed in information technology organizations are well-intentioned, hard-working professionals. A recent census of technology management indicates that approximately 80% care about their users, their organizations and their personal skill sets, and they routinely go the extra mile.

The remaining 7% represents the dysfunctional — those who have an enormous negative impact on the organization's ability to deliver value. The census indicates that dysfunctional information technology professionals come in five basic shapes.

● **Ankle biters.** Ankle biters take the joy and creativity out of computing. They are negative people who spend their working hours in a deathwatch over new initiatives. They complain about the old systems and the new systems; they don't support their colleagues; and they are abusive to end users. Quick to explain why things won't work, ankle biters avoid any and all forms of

The dysfunctional behavior types lurking in the shadows of organizations pose a very real threat to CIOs.

personal accountability. Most ankle biters are beyond saving. Management's one and only recourse is to eliminate them.

● **Noise makers.** Noise makers are more a nuisance than anything else. They can be saved. Their problem is not attitude; it's consistency, focus and delivery. Insatiable readers, they surf the world in search of technology sound bites. They like hearing themselves talk. Yet when all is said and done, they haven't implemented anything.

● **Groupies.** Group-ies are smart, hard-working individuals whose only failing is that they are vendor bigots. They spend their time in the clutches of one particular vendor, speaking at that vendor's user forums and testifying in trade publications as to that vendor's prowess. Management has two options: keep groupies focused on their vendor of choice or try to break the addiction.

● **Nomads.** These individuals link their self-worth to the number of frequent-flier miles they generate. On average, nomads attend a conference a month. They are incurable name droppers (i.e., "I saw Bill Gates at Comdex"),

make great pretenses of being busy, and generate absolutely no tangible output other than enormous expense bills. Viewed by operations as dilettantes and overhead, these are the first breeds to roll in downsizing initiatives.

● **Turfcreaks.** These are perhaps the most dangerous of the dysfunctional beasts in the information technology forest. They practice an obsessive form of Emersonian self-reliance, seeking to establish a given rule set as their own. There are two kinds of Turfcreaks. One is a very smart, not terribly social and frequently misunderstood individual who deep down wants to do the right thing. These individuals can be saved by being teamed with high-energy, positive achievers on a time-driven project.

The second type of Turfcreak should be banned from the organization. This person excels at saying every externally initiated project will be awful. These are the hidden bullies who seek to maximize their power bases.

Contemporary CIOs live or die on availability. Much of that credibility is based on their ability to form consensus and launch high-profile, high-payback and short time frame initiatives. The dysfunctional behavioral types lurking in the shadows pose a very real threat to the CIO's career. The very integrity of information technology depends on its ability to police itself.

May is vice president of research and education at Cambridge Technology Partners in Cambridge, Mass.

Competition, not collaboration

Michael Schrage

To compete or to collaborate? That is the question.

Shakespeare it ain't, but the quality trade-offs associated with software development are enough to make brooding Hamlets out of the most decisive managers. When does it make more sense to have their people collaborate to create value? When do competition and rivalry yield better results?

We all know the classic development cliche: "Fast, good or cheap — pick any two." The challenge is in designing an organization that cooexistally delivers at least those two valuable elements; and if it's really good, it also provides that rare three out of three. How do you get there? One common denominator is that the best development organizations rigorously manage relationships between the folks who code and the folks who test.

Ah, but what *kind* of relationships should they manage? Development organizations seem split to the point of schizophrenia about how best to manage the coder/tester dichotomy. Some organizations tout that collaborative relationships are key. Coders and testers need to communicate, cooperate and collaborate to identify and stamp out bugs. They ask each other, "How can we work together to fix these bugs in ways that don't create new problems?" In stark contrast, many organizations pro-

mote competition and rivalry between coders and testers. The tester's role is to flush out flaws and hurl them right back at whoever they came. There is a battle between coders and testers. It may be a friendly conflict; it may be hostile. But make no mistake: These organizations believe the best way to manage code quality is to ensure that coders and testers don't get too cozy. Competition is valued over collaboration. Indeed, some organizations go so far as to financially reward and publicly recognize testers who track and document the most bugs.

The tester's triumph is the coder's disgrace. A missed bug is the tester's torment. You might guess that coders and testers in these organizations don't do much.

Each approach has its own compelling logic. The fact is, collaborative coding and testing leads to cooperative development, but an awful lot of side deals are surreptitiously made. Coders frequently ask testers not to disclose a bug to management "until I've had a chance to fix it." Testers make suggestions — which they

Organizations seem split to the point of schizophrenia about how best to manage the coder/tester dichotomy.
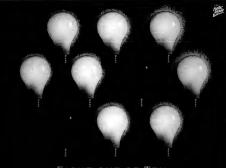
are in a good position to enforce — about how programs should be restructured. Disagreement, thus, has no real way to assess the status of the project because of all these informal side deals and "understandings."

Conversely, an adversarial relationship between coders and testers may guarantee more integrity for the quality development process. Then again, it does little to encourage an open dialogue.

So what will it be — the benefits of collaboration or the fruits of competition? This is where management earns its money because an excellent case can be made either way. How organizations manage the coder/tester dichotomy says a lot about how they want to create value. There are the tough management choices that determine just how fast, good and/or cheap an organization's software will be.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrage@media-lab.mit.edu.

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OS/2 expands as Win 95 nears

By Lisa Picarille

■ With the threat of Microsoft Corp.'s Windows 95 operating system looming on the August horizon, IBM is putting on a full-court press to get multiple flavors of its OS/2 operating system out the door.

IBM is attempting to counter the potential Windows 95 juggernaut by equipping OS/2 Warp Connect, a LAN version of the operating system, for a spring rollout. And this summer IBM is expected to ship a version of OS/2 that runs natively on PowerPC RISC-based systems.

OS/2 Warp Connect will offer users peer-to-peer networking capabilities, hooks to most servers, remote access and enhanced TCP/IP support for dial-up LAN connections to the Internet. Lotus Development Corp.'s Notes Express, a collection of communications and collaboration applications, will be bundled with OS/2 Warp Connect.

IBM showed off OS/2 for the PowerPC earlier this month at CeBIT, a computer trade show in Hanover, Germany. A handful of independent software vendors, including Computer Associates International, Inc., Metaware, Inc., Photon Technology, Inc. and Stardock Systems, demonstrated versions of their applications and developer's tools running under the PowerPC version of OS/2.

Microsoft expects to ship a version of NT running on the OS/2 Warp, *page 42*

Pentium rivals line up

Alternatives approach rollout; Intel readies next-generation P6

By Jaikumar Vijayan

As Intel Corp.'s chip rivals prepare major midyear unveilings of processors expected to match Pentium performance, users can expect further Pentium price cuts and a flurry of products based on non-Intel chips.

By June or July, Advanced Micro Devices, Inc. and Cyrix Corp. are expected to start limited production of their next-generation K5 and M1 chips, respectively. Volume is expected to ramp up in the third quarter, and systems based on the chips are expected mid before year's end.

Meanwhile, Mitpitas, Calif.-based NexGen, Inc., which has shipped Pentium-class processors for several months now, last week previewed a new and smaller version of its Nx586 chip, which is expected later this year. The company claimed that so far more than 100 customers from around the world have signed on for its processors.

Although none of these chips are expected to ship at anywhere near the volume of Pentium chips, they could gain market credibility as major vendors begin to endorse them, analysts said.

"There's going to be a lot of alternatives in the Pentium market this year," said Linley Gwennap, editor of "The Microprocessor Report," an industry newsletter in Sebastopol, Calif.

While Gwennap says Intel will continue to dominate at the high end, "there are going to be some pretty hot" non-Intel systems at the lower end. □

For instance, PC market leader Compaq Computer Corp., which already uses AMD chips in its low-end PCs, said it is qualifying AMD's 100-MHz DX4 chip for use in its mainstream corporate lines. Similarly, the K5 chip is likely to find a major customer in Compaq.

Last week, Compaq Chief Executive Eckhard Pfeiffer once again emphasized that the company is looking to multiple vendors, including Cyrix and NexGen, for its chip requirements.

As time goes by ...

Pentium, *page 42*

Chicago exchange maintains tradition

Move to touch screens avoids cultural trade-off

By Thomas Hoffman

One of the greatest challenges financial exchanges have faced in the move to automation is how not to upset the cultural heritage of the trading pits.

Some floor brokers at a variety of futures and options exchanges have argued defiantly against the deployment of handheld systems for order execution. They say these systems threaten the traditional open outcry market where market makers and brokers execute trades via hand and verbal signals.

Working with Technology Solutions Co., a Chicago consulting firm and systems integrator, CBOE has cut the time it takes for a broker to execute an order in the trading pits from 20 minutes to less than 2 minutes. That reduction is due to a $4 million project called the public automated routing system (PAR), which was designed to allow brokers to enter customer orders on touch-screen PCs from Trinitech Systems, Inc. in Stamford, Conn.

Once a broker logs on to a Trinitech PC and places an order, the information is routed over a TCP/IP Ethernet LAN to an IBM RS/6000 server. The data is then passed over an LU6.2 gateway to an Amdahl Corp. 1400E mainframe, where the orders are processed and sent to the originating brokerage and customer for confirmation.

Technology Solutions wrote the Windows-based order-entry software for 486-based touch-screen PCs, but CBOE built a pilot application using Microsoft Corp.'s Visu-

al Basic programming language to test its viability with floor brokers, according to Gerald O'Connell, senior vice president of the exchange's systems division.

"We already use handheld systems for our market makers, but brokers seem to favor the point-and-shoot touch-screen systems since it's one of the fastest ways to get information out of the pit," O'Connell said. CBOE plans to roll out a total of 100 touch-screen monitors across its trading floor in the next year, he added.

Timely advantage

CBOE's floor brokers said they are pleased with PAR's results. "This system is one of the best advances in automation to come out in the securities industry," said Jimmy Boyle, vice president of Chicago operations at The Charles Schwab Corp. in San Francisco. The touch-screen approach "gives customers timely execution while providing true price discovery of the real market," added Boyle, who has used a Trinitech station since July.

One of the biggest advantages of the touch-screen system vs. the former paper-based order process is that it enables floor brokers to place orders at the market price their customers desire before the market closes. There is no longer a time lag between order execution and confirmation. Even though PAR automates the ordering process, it was designed to give floor brokers a screen image of the paper tickets they have become accustomed to using.

Still, there are some trade-offs between the use of touch screens and handheld systems in the financial markets. Although handheld technologies have not yet fully matured — several exchanges have been wrestling with the appropriate communications frequencies needed to ensure secure transmissions — the mobile devices do provide traders and brokers with a higher level of flexibility.

"If a broker has to wander 15 feet to use a touch screen, they might miss something that another broker might be picking up on," said Karen Scheerger, research director in the applications center at Gartner Group, Inc. in Stamford, Conn.

Although CBOE competitors such as the American Stock Exchange have been testing the use of handheld systems in their trading pits, CBOE is considered to be the leading technology purveyor among financial exchanges, according to analysts and market specialists. CBOE has also tested voice-recognition equipment and wireless headset devices.

CBOE's Gerald O'Connell: The exchange plans to use 100 touch screens on its trading floor

IBM, Toshiba blaze trail with notebooks

Desktop features and high-end capabilities distinguish releases

By Michael Fitzgerald

Together, product announcements from the IBM PC Co. and Toshiba America Information Systems, Inc. are poised to move the notebook market to new heights.

Butterfly, the code name for IBM's new ThinkPad 701C, employs innovative technologies to address shortcomings in screens and keyboards — the two main areas of user complaint about subnotebooks. If users take to the product — and early indications are that they will — it will mean the dawn of a new era for the lightweight but compromised products, which spent much of last year languishing in the market.

Though IBM will have difficulty meeting demand for at least the next two months, "this product is so good we can give them some slack on the supply issue," said Ken Dulaney, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

A selection of the features that should make Butterfly the monarch of the notebook realm include:

- A 10.4-in. active-matrix color screen, equal in size to the biggest screen on the market.
- An expandable keyboard that extends beyond the edges of the product, thus allowing a full-size keyboard in a subnotebook-size package.
- Built-in speakerphone and answering machine.
- Built-in 14.4K bit/sec. modem and infrared.
- The 4-pound 701C costs $3,799 with a passive-matrix color screen and includes up to a 540M-byte hard drive. It has a 25/50-MHz 486DX2 chip, but a later version will include the 25/75-MHz DX4 processor.

Though impressed by the advances in the technology, users may balk at buying, at least initially.

"I'd really like to see the Butterfly," said Stephen

Ades, manager of technical services at First Winthrop Corp., a real estate management company in Boston. But he said Butterfly's cost is probably more than his company would want to spend on notebook technology, particularly with prices so low on comparable desktops.

In brief

Meanwhile, Toshiba breaks new pricing ground in the CD-ROM notebook market with its Satellite Pro 2150CDS, a notebook with a built-in CD-ROM drive and a base price of $3,799. Toshiba also brought out a new Satellite line, the T2100, to replace its popular T1960 value-class notebook.

The two products signal the twin paths notebook development will take this year: IBM's 701C shows off the technical innovation users can expect at the top of the market; Toshiba's Satellite shows declining prices and features that are moving from the high end of the market into the high-volume category.

Toshiba's Satellite Pros are also significant because the high-end model uses a 10.4-in. active-matrix color screen. Toshiba has consistently resisted using that screen because of supply constraints, so the adoption of this technology is a strong indicator that the supply problems are abating.

The new Satellites also abandon Toshiba's former PCMCIA design, which placed PC card slots on two sides of the system. Toshiba now has a design — similar to most on the market — in which two Type II cards or one

Type III card fit in the same slot.

Many users see some interesting possibilities for notebooks, particularly as replacements for desktops. With the right notebook, "we'd probably replace a lot of our desktops," Ades said, adding that notebook pricing must come down perhaps as much as $1,500 before that is feasible.

IBM's ThinkPad 701C features an expandable keyboard that opens up to a full-size keyboard

One more thing

Other information systems managers said the potential for built-in CD-ROM may be a useful technology.

"A built-in CD-ROM is clearly attractive, but what would be extremely valuable would be a CD I could write to," said Ken Rose, manager of information technology at Rollins Hudig Hall of Massachusetts, Inc., an insurance claims adjuster.

Rollins Hudig Hall keeps extensive paper files in expensive office space, Rose said, so scanning to disk would mean significant savings. Its adjusters must also carry cases of files with them on the road, something they could avoid with CD-ROM notebooks.

Some IS organizations applauded the low-end CD-ROM notebook from Toshiba.

"That's great to hear. We are getting into more and more multimedia applications," said Leonard Steinbach, vice president of information technology at the National League for Nursing in New York. Steinbach said the lack of an external floppy wouldn't hurt Toshiba in the eyes of his company, though it is more interested in the high-end, full-motion video capabilities available in Panasonic Computer Systems, Inc.'s V41 CD-ROM notebook.

OS/2 Warp

PowerPC. Developers said native operating systems on the PowerPC will appeal to developers.

"Having an OS/2 for the PowerPC is here and is slated to ship in midsummer [of 1995]. IBM has made OS/2 a rea...

OS/2 update and other interesting facts

- OS/2 for the PowerPC is here and is slated to ship in midsummer
- OS/2 Warp Connect is in final beta and is slated to ship in the spring
- OS/2 Warp sales accounted for 9.2% of all operating system sales in January
- German PC maker Vobis will produce OS/2, a mmer expected to increase the installed base of OS/2 in Europe

As the OS/2 family of products grows, so do sales. In November 1994, sales of OS/2 Warp accounted for 4.7% of total operating systems sales. That figure rose to 9% in December 1994 and grew to 9.2% in January 1995, according to Greg Pajaon, an analyst at Computer Intelligence InfoCorp in La Jolla, Calif.

But some observers are chiding IBM for already having too many versions and thus confusing users.

"No organization, IBM or not, should be going out to users with special versions. Networking is a core fundamental not an afterthought," said John Dunkle, vice president of WorkGroup Technologies, Inc., a consultancy in Hampton, N.H. "Have many OS/2 incarnations can the market potential to take in? IBM needs to send a single consistent message about desktop operating environments. If Microsoft took the same approach, the world would be in an uproar."

Ira Wechsler, membership director of the

OS/2 special interest group of the N.Y. PC Users group, disagreed. "I think IBM has made it clear which versions are for which users, and most of their decisions seem to be what a more practical user."

In addition, OS/2 may also get a shot in the arm from a decision by Germany's largest PC maker, Vobis Microcomputer AG, to drop Microsoft's MS-DOS and instead preload OS/2, which includes IBM's PC DOS, on its systems.

This move is expected to help IBM gain more ground over Microsoft in European markets, where OS/2 has a 60% share. OS/2 beta just a 10% share of the U.S. market, with an installed base of 4 million users.

However, no other PC makers have followed Vobis' lead, and even Vobis officials acknowledged that the company will preload Windows 95 on its systems when it becomes available.

Pentium

Similarly, IBM, which is a manufacturer of Cyrix chips, said it has build processor-independence into its recent line of PC servers to take advantage of same of the non-Intel alternatives that are expected.

In addition, major PC vendors such as Acer America, Inc. and Digital Equipment Corp. also have a limited number of non-Intel-based systems.

Vendor endorsements such as these will help allay customer fears relating to the compatibility issues of non-Intel processors and will also put additional pressure on Intel to cut prices, observers said.

The Microsoft factor

Both Cyrix and AMD are also getting Microsoft Corp. certification for compatibility with all DOS, Windows and Windows 95 applications.

"You cannot really close the book on any of the alternatives out there," said Carl Norman, a manager for PC systems and services at Titleist, Inc. and FootJoy Worldwide in Fairhaven, Mass.

"We have seen some very ag-

gressive Pentium pricing from Intel already and we will continue to see a rapid decrease" in prices as alternative processors ramp up in volume, Gwenapp said.

The next step

Intel, however, will continue to impress.

While Cyrix and AMD say they have the products to take on the Pentium processor, Intel's next-generation P6 is likely to give the company a substantial performance edge through 1996, analysts said.

A recent analysis in "The Microprocessor Report" described how history may repeat, with the company shipping about 500,000 versions of its newly developed Pentium part 12 cache, nonblocking cache, deeper pipelining, a split-transaction bus and advanced branch prediction give the P6 a performance edge over processors such as the K5, M1 and NexGen.

Another major advantage Intel will enjoy for the foreseeable future is the staggering manufacturing volumes that have given it enormous pricing flexibility, analysts said. The company has continued to pour money into new fabrication plants and today holds a very competitive lead in the 0.4-micron process technology, according to the analysis in "The Microprocessor Report."

Phantech Software, Inc. has announced InfoRecall Pro, information management software for Windows.

According to the Toronto company, InfoRecall Pro provides hypertext functions that let users cross-reference any word or record for instant access.

Features include word counting, spell checking, data stamping, undeleting and multiple record importing and exporting. Windows applications can be added and launched from InfoRecall Pro's System Menu without switching to the Windows program manager.

InfoRecall Pro costs $189.
▶ *Phantech Software*
(416) 502-1311

Nico Mak Computing, Inc. has announced WinZip Self-Extractor, a companion utility to Nico Mak's WinZip.

According to the Bristol, Conn., company, WinZip Self-Extractor creates Windows self-extracting .ZIP files that can contain multiple compressed files.

Users can specify default directory for the unzip operation and specify a command to execute when the unzip operation is completed.

WinZip Self-Extractor costs $49.
▶ *Nico Mak Computing*
(203) 585-5376

"Routing Without Integration is Just Plain Dumb!"

Reply Corp. has announced a 32-bit motherboard upgrade option to its series of PowerBoard System Upgrades for IBM PS/2 systems.

According to the San Jose, Calif., company, users of IBM's proprietary Micro Channel-based PS/2 Model 60/65/80 systems have a choice of 50M-byte 66-MHz processors including the 100-MHz DX4 chip and Pentium OverDrive processor.

The upgrade comes with integrated 64-bit local-bus video 64M-byte memory and local enhanced integrated drive electronics support.

Prices start at $1,195.
▶ *Reply*
(408) 942-4804

Envelope Manager Software has announced Dazzle Plus 2.5.

According to the Palo Alto, Calif., company, Dazzle Plus 2.5 lets personal information manager (PIM) users design and print envelopes, labels and cards that can include graphics, text, bar codes and rubber stamps.

The product integrates with PIMs such as Symantec Corp.'s Act, Modatech Systems, Inc.'s Maximizer and Jensen-Jones, Inc.'s Commence. A Dial-a-Zip feature looks up ZIP codes and standardizes addresses from PIMs via modem.

Dazzle Plus 2.5 costs $79.
▶ *Envelope Manager Software*
(415) 321-2640

Genio USA has introduced CrypEdit 4.0, encryption editing software.

According to the North Bend, Wash., company, CrypEdit 4.0 provides a secure environment to edit, view and print multiple encrypted or plain text files. It lets users unencode or undecode, compress or expand, and encrypt or decrypt DOS-compatible files.

The product uses pseudo-onetime pad encryption that requires two passwords. Users can split up a unencoded file into as many as 100 parts and reconstruct a split file. Speed- and size-optimized file compression is included.

CrypEdit 4.0 costs $30.
▶ *Genio USA*
(206) 831-5591

Product short

Waterloo Maple Software has introduced Math Office for Microsoft Corp.'s Word 6.0, an interface that lets users of Waterloo Maple's mathematical software compute and display mathematics and graphics inside a Word document. Cost: $99. Waterloo Maple Software, Waterloo, Ontario (519) 747-2373.

Macintosh: the computer that fits in. Apple' Macintosh' computers can work in virtually any computing environment. They're compatible today. They'll be compatible tomorrow. In fact, the Power Macintosh' 6100/66 DOS Compatible computer has both a PowerPC chip and a 486 DX2/66 chip inside. With simply one touch of a key, you can switch from the Mac' OS to Windows — or DOS — and back again. And every Power Macintosh can run DOS and Windows software with the aid of a program called SoftWindows.'" So you never have to worry about sacrificing your software investment.

Just plug us in. Apple computers have always worked with plug-and-play simplicity. The sophisticated networking capabilities built into every Power Macintosh support LocalTalk' and Ethernet (including EtherTalk,' TCP/IP and Novell IPX protocols). You can easily add Macintosh computers to practically any kind of network, whether it consists of computers running DOS, Windows or OS/2, or UNIX' workstations. Which means you can comfortably add Power Macintosh systems to your company's information system without risk of complications. And you should.

Macintosh: the computer that stands out. At the heart of Power Macintosh beats the revolutionary RISC-based PowerPC microprocessor. It's so fast, in fact, that in tests performed by Ingram Labs, the Power Macintosh 8100/110 was on average 45% faster overall than the fastest Pentium PC tested.* Providing the kind of horsepower that recently moved *PC Week* to write: "The speed of the PowerPC processor, coupled with Windows compatibility, is a compelling reason for some customers to move from a PC to a Macintosh platform."

Real people can do real things. Hundreds of native applications are available for the Power Macintosh, programs that bring both familiar and new capabilities to your users. Since Apple has always been a leader in the development of sound, graphics and video, advanced technologies such as multimedia, videoconferencing and 3-D graphics are simply easier to do on a Macintosh. So companies adopting Power Macintosh computers for real benefits today will also find they have a competitive edge tomorrow, translated into lower training and support costs as well as the ability to execute in-house those jobs that once had to be farmed out.

You can now visit us on the Internet. Our Internet address is http://www.apple.com. Find out how Power Macintosh can easily fit in with your business. And help you leverage the most important power of all. The power to be your best.'

Apple ![Apple logo]

LANS
SERVERS
SOFTWARE FOR GROUPS

Workgroup Computing

IBM TO SHIP
WORKGROUP
MAIL SERVER, 49

Sun stretches Solaris at high, low ends

But concerns about reliability linger

By John S. Borman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. is stretching its Solaris operating system across the computing spectrum. Extensions of the basic Unix kernel are reaching Solaris as a broader operating system for large organizations. While many users do not question Solaris' scalability, some are cautious about bumps in the road as Sun reaches to support even more features in the next Solaris release, due in the third quarter.

The current release, Solaris 2.4, shipped last fall and was the first Solaris release in which SunSoft, Inc. combined support for Intel Corp. microprocessors and Sun SPARC chips. At the same time, Solaris 2.4 improved support for high-end SPARC servers, with performance boosts of 40% or more. And earlier this month, SunSoft addressed the low-end, character-based PC server market with its new Solaris 2.4 Base Server and Network Server releases.

But some users are concerned that short of introducing the robust-based technology, Solaris could be taking on too many tasks this year.

"Things are becoming so complex, to the nature of client/server systems, that there's a much greater domino effect if there's any unreliability," said David

Reaching high and low to stretch Solaris' enterprise reach

On the high end	On the low end
On the low and Sun side:	**On the high and Sun side:**
■ Optimize support for Intel and PowerPC microprocessors	■ Spur scalability of Solaris on high-end 20-way symmetrical multiprocessor servers
■ Ensure support for all midrange PC peripherals and device drivers	■ Make reliability and system controls similar to those of mainframe hosts
■ Boost performance and quality of Solaris-on-Intel	■ Boost performance in each new Solaris release

Pensak, a principal consultant for advanced computing technology at E.I. DuPont de Nemours, Inc. in Wilmington, Del. "Before, it was just one machine that got impacted."

The same kind of growing complexity can be found in most real Unix operating systems, he said, noting that Solaris was

technically ahead with its early support for 1 1/2 System 5.4 and multithreaded applications.

But Sun's support for more types of hardware chips may not necessarily result in enterprises of all-Solaris shops. Instead, many users intend to mix Microsoft Corp.'s Windows alongside with Sun's Unix servers and even Windows NT servers.

"I really don't think the chip is the issue for us anymore," said Fritz Fridman, information systems director at the Alberta Cancer Board, a government agency in Edmonton, Alberta. Solaris, page 49

Teetering on top

Industry analysts said SunSoft realized it had to spread its Solaris bets across three hardware platforms — Intel, SPARC and PowerPC — as it moved to supply server software for the enterprise. Staying with Sun's SPARC machines alone, even though 300,000 SPARC units shipped last year, is no longer adequate if Solaris is to remain the top Unix operating system.

"The reality is that the success of a chip depends on [sale] volumes," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "And it's clear today that Intel and the PowerPC

have the volume lead." Sun always said it wanted to be the volume leader, but it has shifted its emphasis from desktop Unix workstations to commercial Unix servers in a quest for higher profitability, analysts said.

Beyond new support for the PowerPC, SunSoft has not yet shown all the Solaris products it is holding in its portfolio, including those that will broaden the Sol-

aris user base. Solaris 2.5 will debut at the Solaris Developer Conference in San Francisco this spring, followed by beta testing in the summer and fall. That timetable was provided in late January by former SunSoft President Ed Zander, who is now president of Sun Microsystems Computer Co.

"I think we're doing very well," said Janpieter Scheerder, general manager of the Solaris products group, earlier this month. However, Scheerder noted that the task of coordinating independent software and hardware vendor support will take several more months. — Joan S. Borman

Lotus improves network management with NotesView

By William Brandel

● At the end of the month, Lotus Development Corp. will deliver the first version of NotesView, a comprehensive Notes network management platform that users are anxiously waiting for.

NotesView is designed to collect system, database, replication, mail and network information from Notes servers. The NotesView console graphically displays this activity for Notes network managers, who can then analyze the network traffic in its inaugural rendition. NotesView will run on Hewlett-Packard Co.'s Simple Network Management Protocol-based OpenView for Windows.

Notes users have asked for a comprehensive management tool since Notes began proliferating their sites. NotesView is a step forward from the limited, text-based management tools that are now bundled in Notes.

Beta users of the product said it lives up to its billing.

"It is very helpful in troubleshooting the network," said Howard Gersh, a senior systems analyst at Nynex Corp. in New York. "It saves time by presenting you the information in graphical form. Before, you had to look at most of this information in text form."

Mark Melvin, a consultant at Information Evolution in New York, said, "It gives the user more flexibility in managing the Notes network." Melvin is currently eval-

uating NotesView for a major investment firm in New York.

Melvin said network administrators can set up rules and thresholds for monitoring Notes, which hitherto was not possible in any format. NotesView also gives administrators the ability to monitor replication across the network, a key issue in managing Notes servers.

Close, but no cigar

However, beta users said the product is not perfect. Melvin said NotesView in its current beta form is a memory hog. Melvin manages 230 Notes servers at his site, and when he tries to map his servers with NotesView on a system loaded with 32M bytes of RAM, it freezes, he said.

"We have to run this with 64M bytes of memory," Melvin said. "That definitely rules out the portable laptop as a Notes management tool."

Not all Notes users are clamoring for NotesView. For example, Equitable Variable Life Insurance Co. in New York has not yet determined whether it needs NotesView, a company spokeswoman said. Another Notes

site, Waters Corp. in Milford, Mass., said it does not need the product.

While currently imperfect, NotesView is a step in the right direction, said Matt Cain, an analyst at Meta Group, Inc., a consultancy in Stamford, Conn. To gain broad appeal from companies with enterprisewide networks, Cambridge, Mass.-based Lotus must embrace all industry network management platforms, such as HP/UX, IBM's NetView or Sun Microsystems, Inc.'s SunNet Manager, if it is to succeed, he said. "As it stands now, users have to choose whether they want to learn to run Open-View for Windows or whether they want to manage their Notes environment," Cain said.

NotesView's current lack of scalability and portability is an issue with users.

"We are a NetView-for-AIX shop," Gersh said. "We don't use HP OpenView and would like to see it ported to NetView. As it stands now, we have to learn OpenView and support another network management platform, too."

A NotesView console graphically displays information gathered from Notes servers.

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COMPUTERWORLD

·*Leadership Series*·

THE THREAT TO YOUR COMPANY'S
PREPARE
INFORMATION INFRASTRUCTURE
YOURSELF
IS NO LONGER SCIENCE FICTION.
FOR
THE DANGERS ARE REAL, THE COSTS ARE STEEP,
INFORMATION
AND AN ATTACK COULD BE CATASTROPHIC.
WARFARE

By M. E. Kabay, Ph.D.

TECHNOLOGY has provided both weapon and target throughout history. When warriors mounted horses, their steeds were a threat to opponents and vulnerable to attack. A single horseman could dominate a battlefield of foot soldiers, but the enemy had only to stop the horse to stop the horseman. And to imperil a nation of horsemen, the enemy had only to poison the herds' water supply.

The computer is the defining technology at the end of the 20th century. Computers are pervasive, necessary and vulnerable to attack. They are linked in networks spanning both corporate and national boundaries. But although connectivity opens possibilities for electronic commerce, it also opens opportunities for electronic crime, espionage and outright warfare.

Attacks on data confidentiality and possession as well as on the integrity, authenticity, availability and use of such data can cause untold damage. No one is immune: Individuals, corporations, government departments and agencies, nations and supranational bodies such as the United Nations and NATO are all vulnerable. We need to create legal, organizational and cultural de-

The World Trade Center bombing caused more economic loss through interference with business communications and information processing than it did by physical damage to the building.

fenses against information warfare at all of these levels. Information systems managers, in particular, must familiarize themselves with this threat and begin to implement systems that will minimize their organization's vulnerability to electronic warfare.

LEVELS OF INFORMATION WARFARE
In his recent book, *Information Warfare: Chaos on the Electronic Superhighway*, security expert Winn Schwartau defined three levels of information warfare in which criminal activity is pervasive: interpersonal, intercorporate and international or intertrading block. IS leaders need to be well versed in all three areas.

Interpersonal information warfare targets an individual. Recent cases include impersonation and slander in cyberspace, appropriation of credit records for fraud and theft, harassment and loss of privacy.

Schwartau nearly had his reputation ruined a few months ago when someone used his log-on to a popular San Francisco network, The Well, to send out nasty attacks on a criminal hacker.

Similarly, a university professor at Texas A&M University required police protection

Illustrations by David Flaherty

after someone stole his electronic identity and sent out thousands of obscene and hateful mail messages attacking various ethnic groups.

In cases of fraud and theft, victims are helpless once their social security numbers and credit records are stolen. Thieves can rack up thousands of dollars' worth of debt on stolen credit-card numbers, leaving the victims with ruined credit ratings.

Loss of privacy can be equally devastating. In one Florida case, computers with medical records on 8,000 carriers of HIV, the virus that causes AIDS, were stolen. Criminal hackers have also harassed people by manipulating their phone services. In one example, a phone phreak, as these hackers are called, transferred all of the phone charges from a local hospital to a residential phone line.

Intercorporate information warfare can ruin companies and other private organizations through industrial espionage, theft and disruption of services. For example, criminals have been known to use binoculars to watch phone booths at airports and train stations to steal callers' calling card codes. The theft of telephone services is estimated at $8 billion in North America alone.

Another horror is "van Eck phreaking." Wim van Eck, an electronics research scientist in the Netherlands, demonstrated in the mid-1980s that it is possible to re-

> No one is going
> to bother to
> attack a failing,
> incompetent,
> inefficient corpora-
> tion. The likeliest
> target has to be
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> competitor.

construct the words on a computer VDT from a distance using inexpensive equipment by decoding the radio frequency emissions from the monitor. With such techniques, an industrial spy can glean information from countless terminals and workstations without the risk and inconvenience of physically tapping communications channels.

Computer criminals can disrupt day-to-day business through what is commonly called "denial of service." Denial of service attacks can harm individuals and organizations by saturating a necessary resource. Examples of this include loading 800 numbers with unwanted calls, fax attacks, unwanted bulletin board file uploads and mail bombing runs, (in which individuals or groups deliberately overload electronic-mail systems with a huge volume of E-mail).

Other corporate attacks include leaking confidential information. Both the airline and the automotive industries have been victims of such attacks. American Airlines and Northwest Airlines, for example, are embroiled in a bitter court battle over the alleged theft of spill tables, which contain precise information on the number of no-shows expected for commercial flights. In Europe, General Motors Corp.'s Opel division lost one of its executives to rival Volkswagen AG in 1993; Opel claimed that Volkswagen arranged to steal valuable corporate data, including information about new models.

On the industrial espionage front, firms have hired moles in rival companies to send out closely held information via E-mail. Borland International, Inc. and Symantec Corp. are involved in a court case in which a Borland executive allegedly agreed to work for Symantec and then sent sensitive Borland documents with competitive analysis data to his future employers via the Internet.

International or intertrading block information warfare has the potential to disrupt international markets, international business and government-to-government relations. Terrorist organizations and nations are aware of the low cost and minimal risk of attacks on information infrastructures, as opposed to physical attacks. The World Trade Center bombing, for example, caused more economic loss through interference with business communications and information processing than it did by physical damage to the building.

On a global scale, an aggressive country could acquire a significant competitive advantage over a trading partner by corrupting widely used company software or inserting logic bombs into microcode for new micro-

processors. The collapse of the Soviet bloc has made thousands of skilled programmers available for such subversion.
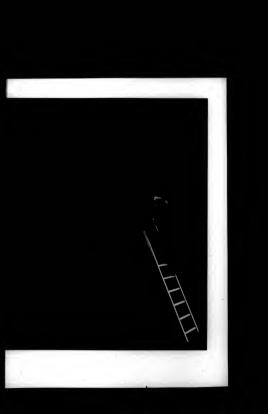
The proliferation of electromagnetics weapons is another area of concern for both corporations and international markets. High Energy Radio Frequency (HERF) guns and ElectroMagnetic Pulse Transformer (EMPT) bombs are already easy to build from off-the-shelf components, and they are fairly inexpensive. The effects of even hand-built HERF or EMPT weapons can damage microprocessors at ranges of hundreds of meters. A van equipped with suitable electronics could cruise down Wall Street and disrupt — or even wipe out — the information processing capability of thousands of computers without being detected by the local police.

COMBATING COMPLACENCY

Even though IS managers have heard many of these information warfare horror stories, few are taking steps to protect their corporate assets. As in conventional warfare, inaction is tantamount to surrender.

IS managers need to recognize the changing face of threats to the information infrastructure. Where once they were content to recognize acts of God as threats, they must increasingly pay attention to acts of people. Errors and omissions are still a major problem for information technology security; so are dishonest and disgruntled employees. However, deliberate attacks are increasingly tempting to criminals, dishonest competitors and terrorists, and the more visible and successful the potential victim, the greater the odds of his becoming a target. No one will bother attacking a failing, incompetent, inefficient corporation; they have higher target has to be the successful, effective, efficient competitor.

Too often, corporate managers don't view security as a real problem if no

The theft of telephone services is estimated at $8 billion in North America alone.

damage has been done to their company yet. Such thinking is irresponsible and could lead to potential liability. Corporate stakeholders should not tolerate corporate executives who fail to exercise due care and diligence in carrying out responsibilities, including the security of company data. Companies must take security threats seriously.

FIGHTING BACK

IS managers must take action to combat computer crime. Here are a few specific steps to consider:

• Convene a task force on information technology security with members from every sector of your organization. Define the mission of this task force to include evaluating threats and vulnerabilities to deliberate attack on your information systems.

• Analyze your information resources from an enemy's point of view. Examine how much effort it would reasonably take a disgruntled employee,

an unscrupulous competitor or a hostile government or cartel to steal control of company information.

• Work out scenarios involving deliberate sabotage of your information systems and study their vulnerability to such attacks.

• Evaluate the consequences of denying service attacks, rumor-mongering on the Internet and interference with your phone- and voice-mail systems.

• Examine the implications of eavesdropping, illicit surveillance and van Eck phreaking.

• Having established a range of plausible targets, examine the mechanisms your company has available to thwart possible attacks, and evaluate their expense. Begin your counterwarfare preparations by guarding against inexpensive attacks that have the biggest potential for harm to your organization.

• Prepare contingency plans for reasonable types of attacks. Create a Computer Emergency Response Team (CERT) to handle virus incidents, analyze errors and omissions that can cause damage to your systems and investigate penetration of your security screens.

• Implement written security policies

SEVEN THREATS FROM CYBERSPACE

THE recent National Computer Security Association's Second International Conference on Information Warfare focused on the likelihood and nature of deliberate attacks in cyberspace. Here are some of the more threatening types of attacks companies should protect themselves against:

• Data theft by employees who copy proprietary data onto diskettes.
• Penetration of computers using standard passwords that a systems manager should have changed.
• Industrial espionage by criminals eavesdropping on wireless communications who have sought employment to defraud their employer.
• Deliberate, unauthorized modification of production software by criminals who have sought employment to defraud their employer.
• Theft of employees' identities to make outrageous statements on the Internet, ruining those employees' reputations.
• Rumor-mongering on the Internet or on commercial networks designed to depress stock values or interfere with sales.
• Denial of service attacks.

with the support and commitment of upper management and the members of the information security task force. Have employees read, understand and agree to uphold their security responsibilities.

• Make security a part of your corporate culture rather than paying lip service to password policies and backup plans.

SECURING CYBERSPACE

Even though no one will ever be able to provide probability figures for information warfare attacks on a specific organization, a database of information warfare incidents would provide a basis for rational decision-making among organizational leaders. Corporate management should encourage companies to report all computer emergencies to a central agency.

The CERT Coordination Center at Carnegie Mellon University in Pittsburgh would be an excellent repository of such information. The center already safeguards victim confidentiality. A mechanism for collating statistics and reporting them periodically or on demand would greatly benefit decision-makers.

Failing the voluntary cooperation of business, academia and government, we may need to institute mandatory reporting based on models that already exist for public health (Centers for Disease Control), the securities industry (Securities Exchange Commission), workplace accidents (Occupational Safety and Health Administration) and the broadcasting and telephony control (Federal Communications Commission).

We must also provide an interoperable means of identification and authentication for communicating in cyberspace.

Nonrepudiation — the assurance that a message ostensibly sent by a specific person really came from that person — must be an integral part of public and private electronic discourse. Unless a way to drive home the consequences of irresponsibility on the Internet, we will suffer greater intemperance by vandals. The signal-to-noise ratio, which is already quite low in many sectors of cyberspace, will only worsen if anonymity and pseudonymity are allowed to become the norm.

WHO HAS JURISDICTION?

We need to resolve the problem of jurisdiction at both the national and the international levels. Trying to catch information technology abusers by relying on state laws is difficult because jurisdiction is usually defined in terms of geography. What is the geography of cyberspace? There are three functions in communications: origination, transmission and reception.

If a criminal in Des Moines, Iowa, logs on to a computer in New York to steal information that's on a computer in San Francisco, under which geographically defined jurisdiction does the violation fall? If the criminal is physically in Australia and targets a victim in France using U.S. computer systems, who should prosecute? Efforts are already in place to hammer out the cyberspace equivalent of the Law of the Sea; a number of legal and computing experts have begun working quietly to develop agreements on jurisdiction in cyberspace. IS management should support and get involved in these efforts as they emerge.

Another valuable contribution to the evolving field of information technology security is the Generally Accepted System Security Principles (GSSP) initiative, which is supported by many professional organizations and is spearheaded by the Information Systems Security Association. The GSSP, when complete, will provide a basis for communicating the consensus of security experts around the world regarding principles and practices for protecting information technology.

Battling computer crime requires companies to fight on many fronts at once: on the personal, company, national and international levels. Only a concerted effort will prove successful in the long run. Leadership, however, must come from the corporate IS community, and it must come soon.

ABOUT THE AUTHOR

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A van equipped with certain electronic equipment could cruise down Wall Street and disrupt — or even wipe out — the information processing capability of thousands of computers without being detected by the police.

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do you have?

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we've helped provide solutions to
thousands of companies around the globe
If the business decisions are yours,
the computer system should be ours

HEWLETT
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Computer Systems

IBM to ship Workgroup mail server

By Suruchi Mohan

Hoping to woo the substantial base of AS/400 users to its workgroup mail strategy, IBM will ship Workgroup mail server for OS/2 and OS/400 by the end of the second quarter.

This server addition joins IBM's already existing front end, the UltiMail client for OS/2.

The release will be important to the large number of AS/400 sites using IBM mail and office software, noted Amy Wohl, editor of "PressLetIer," a monthly newsletter in Narberth, Pa. "Enhancements are necessary to keep them happy and new customers interested," she said.

For many users, though, IBM is too late. Bill Cook, manager of software development at Miel Corp. in Jackson, Miss., said, "Three or four years ago, we would have switched it in our business operations. They got a late start on it."

IBM's Workgroup mail server does not appeal to Miel because the company has developed in-house software based on IBM's Office-Vision application programming interfaces, and all business applications are integrated with the OfficeVision product, Cook said. Miel uses OV/400 as well as Lotus Development Corp.'s CC-Mail, with a gateway linking the two platforms, he said.

Too late for some users

Ken Presser, manager of technology support at Sara Lee Intimates in Winston-Salem, N.C., said a couple of years ago, IBM's offering may have been more attractive. "We looked at an AS/400 product, but it didn't do what we needed it to do — interface to the PC mail product we had at that time," he said. Sara Lee does not need any electronic mail on the AS/400.

But for those who rely heavily on the AS/400 for mail, this announcement is good news. Marc

Novik, director of information management at Coram Healthcare Corp. in Miami, said he is excited that IBM is finally offering workgroup support on the AS/400. Right now, the company runs AS/400s running OV/400 for mail that support 80 facilities throughout the U.S. Coram Healthcare also has Microsoft Corp.'s Mail connected to OV/400 via a gateway.

OV/400 is adequate right now, but Novik said the company wants a workgroup product for the AS/400 so staffers can send attachments with E-mail and share documents and data.

IBM's Workgroup mail server will support multiple clients, including Microsoft Mail, CC-Mail and any Messaging Application Programming interface-based client, said Ralph Pollack, program manager at IBM Workgroup Strategies in Sommers, N.Y.

Initially, IBM will ship for mail support for the AS/400; calendaring and scheduling will follow in the next quarter, and document management and workflow will be released shortly after that.

Solaris

cy that provides cancer-care clinics throughout the Canadian province of Alberta. The Edmonton site has 17 Sun servers, 100 Sun workstations, 500 Windows PCs and 3 Windows NT servers.

"We are very happy with both Solaris and NT, but we really cannot ignore some of the things NT is offering us in terms of lowering our overall operating costs," Fridman said.

The portability of Solaris code onto Intel PCs appeals to many Sun users. Some large Sun sites said last week that they anticipate moving Solaris 2.4 to Intel machines as soon as possible. One proposed use: Solaris-on-Intel as a low-cost development platform for enterprise applications. But even as Solaris 2.4 ships on new Sun machines, most large-site users want to know more about the upcoming Solaris 2.5.

Enhancements expected

Solaris 2.5 will take on even more tasks. It promises support for IBM's PowerPC platform and Exos for some of the more glaring Solaris 2.4 peripheral-support bugs. It also includes SunSoft's Project Distributed Objects Environment programming framework.

At the same time, Sun will tune the operating system to run on the UltraSPARC RISC chip, Sun's first 64-bit chip. "It'll be everything but the kitchen sink when they get done," said one longtime user of SunOS, the operating system that preceded Solaris.

Several Sun users said they believe Sun is putting enough resources into software-testing programs to ensure that the Solaris 2.5 release is stable. For example, Pennak said, beta testing may last as long as six months. "My understanding is that they're working very hard on 2.5 to make very sure that when it comes out it's very, very solid," he said.

But users logging on to the Internet in February reported some problems with Solaris 2.4, including Network File System performance, the binary-compatibility option for aging SunOS applications, peripherals support and occasional problems linked to Unix services. Users contacted by Computerworld this month said there are still bugs but not an inherently high number.

Eric Jaeger, technology marketing manager at SenSoft, denied that there are any major problems with Solaris 2.4. He said Solaris 2.4 running on a 90-MHz Pentium chip performs "in the lower end of the SPARC range," confirming user statements about somewhat slower performance on Intel. He also acknowledged that Solaris 2.4 must be stored in a separate memory partition if users want to dual-boot it from a single disk that also contains Windows.

Some longtime Sun users brushed off the notion that Solaris 2.4 was not holding its own. "Everything I have heard about 2.4 has been very positive, like finally they're getting it together," said S. Lee Neary, network manager at Johns Hopkins University's physics and astronomy department in Baltimore.

"I don't hear anybody complaining or worried about it," said Neary, who has been active in the national Sun Users Group. "They've relieved it's finally working."

Alternative suppliers

Aspen Systems bases product line on Digital's 64-bit Alpha chip

By Neal Weinberg

Aspen Systems, Inc. has gone out on a limb, becoming the first company to base its entire product line on Digital Equipment Corp.'s Alpha chip.

Nine months ago, Aspen in Wheat Ridge, Colo., released its first scaled-up workstations and servers powered by Digital's 64-bit chip and running Microsoft Corp.'s Windows NT. The next step for Aspen is this month's scheduled unveiling of Alpha chips running Digital's OpenVMS operating system.

"No risk, no reward," said Aspen president Steven L. Spring. He said tying his 3-year-old company's fate to Digital's Alpha technology was a gamble he was willing to make.

Spring said OpenVMS was "an easy decision" that gives Aspen an entry into Digital's huge VAX/VMS base, which is estimated at 10 million users. And it provides opportunities in new markets for customers looking for a proven, robust, application-rich operating system on a fast, 64-bit platform, he said.

"This is great news for users," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. The existence of an alternative supplier for Alpha-based products means customers have more leverage in negotiating prices.

Foundation Imaging, Inc., which does computer graphics and animation for network television, uses three 275-MHz Aspen workstations, said senior partner Paul Bryant. He said the machines "blow away anything available on the market."

Bryant said there were a couple of bugs in the beginning, but the technical support has been good. In January, the Fremont, Calif., com-

pany added a third machine to the two it purchased last November.

Brett Federsack, a project manager at Network-1 Software & Technology, Inc. in Grand Prairie, Texas, is testing his company's dial-in security software onto an Aspen box running OpenVMS. He said Aspen offered "the best bang for the buck," and that it made perfect sense because his company's software was written to run on VMS.

Network-1 reaches No.1 Access Plus, a "black box" security system that is being targeted at Digital and non-Digital shops. The issue of whether OpenVMS is proprietary or open does not really matter, Federsack said. Once the product is installed, "you plug it in, and it works," he said.

In the works

Digital has been trying to license OpenVMS to other vendors for some time, and although Aspen was the first to climb aboard, a Digital executive said additional deals are in the works.

The VMS operating system was introduced in the late 1970s, and Digital changed the name to OpenVMS in 1992. Since then, the company has been adding standard software components to improve the system's interoperability.

Spring said Aspen is targeting its products in niche areas, such as three-dimensional modeling and animation.

Aspen said it is not simply producing Alpha clones. The company has added some variables, including a 128-bit wide data path instead of 64 bit for faster access to cache memory. In one sense, Aspen competes with Digital, but in another, they are partners. "Obviously our success is their success and vice versa," Spring said.

IBM beefs up technical support for PC server users

By Jaikumar Vijayan

■ IBM is backing its recently announced line of PC servers with a 90-day technical support program aimed at easing the server installation and configuration process [CW, March 13].

The company last week announced its new IBM PC Server Start Up program under which users can get multivendor telephone support and guidance for the setup and installation of a PC server system. By placing a single call to an IBM technical support line, users will have access to installation information and assistance from a number of participating vendors.

Apart from basic support charges, there is no cost for the additional support.

IBM so far has lined up several major network companies and software vendors for its initiative. Those vendors include Banyan Systems, Inc., BusLogic, Inc., Madge Networks, Inc., Microsoft Corp. and Novell, Inc.

According to Angelica Horaitis, director of worldwide marketing of IBM's PC

servers, the program is the company's attempt to provide "one-stop support for IBM customers."

"With just one call to IBM's HelpCenter, users can get their problems resolved immediately," she said.

Added benefits

In addition to support from the IBM HelpCenter, buyers of the new PC server product line also receive IBM's ServerGuide, a CD-ROM containing systems management tools and network operating system installation aids.

"There are a lot of complexities involved in implementing shared-resources computing that are not an apparent part of the purchase," especially for those users moving into it from a stand-alone PC environment, said Peter Burris, an analyst at International Data Corp. in Framingham, Mass.

According to Burris, the 90-day support period should take care of most installation and configuration hassles.

"Most of the problems involved [with these issues] are much more likely to be identified and resolved in this period," he said.

W. P. Holiday

Managers need not live chaotic lives

Stan Schatt's Feb. 20 column made reference to the good old days of Ozzie and Harriet, when the lifestyle was well-ordered and harmonious.

He said the Ozzie-and-Harriet lifestyle was reflected in the IS workplace of the 1980s, the glass house data center — where the media was a place for everything and everything in its place, and the world was peaceful and tranquil. He compared those days with the 1990s, where the lifestyle is more like that of the Simpsons and the IS manager's life is in chaos because of networks, client/server and other new technologies. But that's not so — unless you allow it to be.

True, keeping up with product information in the old days was easier than it is today, but it really wasn't quite as simple as Schatt portrayed. A few magic words can make it much simpler than the technologists would like you to think. The magic words include planning, management, leadership, judgment and professionalism.

A manager who acts professionally and uses good judgment will plan before jumping into any project. The

manager will use the knowledge of the technical people to help make the decisions required to support the business and move it ahead. The technical people will not make decisions in a vacuum. The manager will not allow the organization to be jerked around by vendors who thrive on product churn and love multivendor environments that let them point fingers instead of resolving issues.

Lynn, the network manager in Schatt's article, will not need to dress casually (there will be no need to lower our standards) because the file servers will not be taken apart or tinkered with, especially while the business is running. She may not have a one-vendor shop, but she should have a shop with a prime contractor who is her single point of contact for which she or someone under her command is the vendor manager. The manager will require that the system management disciplines such as change management and problem management be used. By using these disciplines, problem prevention, not problem solving, will become the norm.

When a phone line is needed, Lynn or her manager will call the company's network provider, whom the company will have chosen after studying the availability and price/performance of several vendors. By using the systems management discipline of capacity planning, she will know well in advance when that additional line, that additional file server, those additional desktops and so on are needed.

Lynn's office will not look like a used computer parts store. She will not be under pressure to test and then install various software and/or components. She will be able to return her phone calls because they will be from

people who have business opportunities to which she can contribute ideas and solutions. She will be sought after because of her contributions to the business through her technical skills.

Signs of success

In evaluating operations and business processes, I have found that the competence of an organization is usually inversely proportional to the number of Post-It notes hanging on the walls and PC monitors. I also begin to worry when there are more technical journals in the manager's office than business publications. What I like to see hanging on the wall, in a formal, conspicuous place, are charts and graphs that show numbers of transactions (going up), numbers of outages (going down), mean time between failures (very long), mean time to repair (very short), unit costs (going down) and the Top 10 users of my services (names and departments) — in other words, total quality information, the kind upper management

> A manager who acts professionally and uses good judgment will plan before jumping into any project

can understand.

Many years ago people believed, and we helped them believe, that IS was black magic. It may have been black magic then, but it isn't now. We manage a business and lead good people to make sound business decisions where technology can help. In any case, I do not want my children or my grandchildren to be like the Simpsons, and I don't want my business to be run by people who are like the Simpsons. It doesn't have to be that way.

Holiday is a consultant and contractor in Cincinnati. His electronic-mail address is grbfd58d@prodigy.com

Workgroup Computing

Netpower, Inc. has announced the FASTseries SMP Server for Microsoft Corp.'s Windows NT.

According to the Sunnyvale, Calif., company, the symmetrical multiprocessing (SMP) server will equal the performance of Unix SMP servers.

The server runs Microsoft's Back-Office application suite, which includes Microsoft's SQL Server. It uses a proprietary chip that allows two Mips Technologies, Inc. R4400 64-bit RISC processors to access memory simultaneously.

Prices range from $13,385 for a 150-MHz uniprocessor to $23,085 for a 200-MHz dual-processor system.

▶ *Netpower*
(409) 522-9999

Digital Tools, Inc. has announced Auto-Plan Enterprise, a family of Unix automated project management products.

According to the Cupertino, Calif. company, AutoPlan Enterprise has added AutoPlan Client for Windows, Extension for Microsoft Corp.'s Project, Exchange and Graphics Plus to its base AutoTeam and AutoPlan Enterprise Toolkit products.

AutoPlan Client for Windows lets PC users work seamlessly with other users

on Unix platforms. Extension for Project provides two-way data exchange between Project and AutoPlan, and Exchange provides two-way project data for calendar pool data exchange between AutoPlan and Sybase, Inc. or Oracle Corp. databases.

Prices for each product range from $495 to $10,000.

▶ *Digital Tools*
(408) 366-6920

Brooktrout Technology, Inc. has announced Quadralux, a fax and voice processing system administered from a Windows application.

According to the Needham, Mass., company, Quadralux sends and receives faxes, records and plays back voice prompts and messages, detects and interprets Touch-Tone signals and provides adaptive call progress.

The product comes with a fax-on-demand application and requires no user programming or assembly.

Prices start at $2,995.

▶ *Brooktrout Technology*
(617) 449-4100

CNet Technology, Inc. has announced CN100TX, a "fast" Ethernet adapter designed for use with multimedia or graphics workstations and Pentium- or RISC-based network servers.

According to the San Jose, Calif. firm,

the full-duplex, Peripheral Component Interconnect bus CN100TX supports both 10M and 100M bit/sec. networks and requires no user configuration.

The product includes driver software for network operating systems running at 10M to 100M bit/sec.

CN100TX costs $259.

▶ *CNet Technology*
(408) 954-8000

Modatech Systems, Inc. has announced Maximizer Enterprise 3.0, workgroup contact management and sales force automation software.

According to the Vancouver, British Columbia, firm, Maximizer Enterprise 3.0 features a sales methodology, a library of sales strategies, forecasting and data organization via electronic mail.

A full-contact management driver and an Object Database Connectivity driver are also included. Maximizer Enterprise 3.0 costs $600 per user.

▶ *Modatech Systems*
(604) 726-9688

V-Systems, Inc. has announced VSI-Fax for Windows, client fax software for its VSI-Fax Unix server software.

According to the San Juan Capistrano, Calif., company, VSI-Fax for Windows installs like a print driver, so users can fax right away.

Faxes can be sent from any Windows

application. The software does not require users to know Unix commands to work with the Unix server software.

Prices range from $80 to $200 per user.

▶ *V-Systems*
(714) 489-8778

Andyne Computing Ltd. has announced Pablo for Windows, decision-support software.

According to the Kingston, Ontario, company, Pablo lets users view and manipulate summary data residing in corporate relational databases. Data can come from multiple sources to the same desktop user document.

The product uses multidimensional data structures that let users analyze data and produce complex tables, charts and reports that incorporate the resulting analysis.

Pablo costs $695.

▶ *Andyne Computing*
(613) 548-4355

Product short

Data Fellows, Inc. has introduced Vineyard 1.1.3, an international version of its workgroup visual information management software. All objects are represented as icons that can be connected into graphical forms. Cost: from $198 to $395 per user. Data Fellows, Mountain View, Calif. (415) 694-7160.

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STRUCTURED CABLING SYSTEM
IS ONE THING.**

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IT GOES THE DISTANCE
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INTERNETWORKING
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MICROSOFT NETWORK
DEMONSTRATED, 61
NEW PRODUCTS, 65

Vendors restrict use of scanning software

By Gary H. Anthes

"Attack scanners," software designed to probe networks of Unix computers looking for security holes, got a tarnished reputation recently when the Internet community learned of the imminent and widespread release of one such tool that is particularly powerful.

However, most vendors of attack scanners say they take pains to limit use of their products to legitimate users.

An attack scanner known as Security Analysis Tool for Auditing Networks (SATAN) is scheduled to become available on the Internet in any and all takers next month via anonymous file transfer protocol. Some security experts have complained that SATAN will be used more by those on the outside to hack into corporate networks than by network administrators [CW, March 6].

Know your buyer

Bellcore, which developed an attack scanner called Pingware in the wake of the notorious 1988 Internet worm, carefully screens would-be Pingware buyers, said John Guappone, director of network and information security. "We limit who it is sold to," he said. "If a company calls

about it, we conduct their security organization and let them know we are pursuing a sale into their company."

Milkyway Networks Corp. in Ottawa will use a different approach for its Netsis scanner, scheduled for introduction this fall. According to Milkyway President Hung Vu, buyers will be required to provide the IP addresses for their hosts. Then, after verifying those IP addresses with the appropriate IP address registration body, Milkyway will embed the addresses in the software so it cannot scan across other hosts.

Internet Security Systems, Inc. in Norcross, Ga., follows a similar approach for its Internet Security Scanner.

Internet Security Scanner.

Security Management Analytics, Inc. in Hudson, Ohio, recently introduced a network scanning service using freeware from an Internet World-Wide Web site. A user anywhere can enter any IP address and the scanner will probe that IP host. However, the results are sent by electronic mail to the "postmaster" at the scanned site, not back to the person requesting the scan. The results of the scan include the name and IP address of the site requesting the scan.

Nevertheless, the service has alarmed some systems administrators who re-

ceived scan reports they were not expecting.

"Somebody got one of its password files in a scan report and sent me E-mail saying, 'What the hell is this?'" said Frederick Cohen, president of Management Analytics. "They found out a student had requested it, and they chatted with the student, and he agreed that it was perhaps overzealous.

"I started getting complaints from all over the world," Cohen added. As a result, the service can now be invoked only by someone with a secret key, which Cohen provides only to those who can prove they are bonafide systems administrators.

Cohen said his service is based on a collection of public domain software including a demonstration version of Internet Security Systems' scanner. "And when it comes out, we'll stick SATAN in there," he said.

Inherent dangers

According to Michel Kabay, director of education at the National Computer Security Association in Carlisle, Pa., an attack scanner that lacks controls to limit its use is a danger to the user community.

"In general, vulnerability scanners must be written so that they cannot run in ordinary user mode," he said. "Any

tool that scans hosts looking for vulnerabilities should be impossible to run the program unless you have 'root' capability."

Eugene Schultz, deputy program manager for the International Information Integrity Institute at SRI International in Menlo Park, Calif., said SATAN should not

be posted publicly on the Internet.

He said SATAN's authors — a security specialist at Silicon Graphics, Inc. and another at a university in the Netherlands — should distribute SATAN only via a trusted channel such as the National Security Agency or the National Institute of Standards and Technology. "If they would distribute the tool properly, it could be a great thing," he said.

But Kabay was skeptical of that approach. "The criminal underground is not subject to rational controls unless we are at the starting point of distribution, in which case you'd delay them by a few months," he said. "But let there be no doubt — it is highly unlikely that such tools will remain in the domain of legitimate users for very long."

Airline awaits more reliable handhelds, wireless networks

Portables could serve as extension to Sabre reservation system for American Airlines

By Michael Fitzgerald

If technology could fly, American Airlines Corp. could have been the one to make it happen. AMR's Sabre on-line reservations system is a legendary example of how information technology can better a company, and how AMR wants to find a way to use handhelds and wireless computing.

Bruce Kimball, mobile computing manager in the Sabre group, said early portable wireless access could open up interesting possibilities for AMR's American Airlines subsidiary.

For instance, teams of agents with handhelds linked to Sabre via wireless communications could meet planes that

have been canceled or delayed and reschedule passengers more quickly than they can now. Or American could expand services and reduce costs in crowded airports, such as London's Heathrow.

At Heathrow, American pays $100,000 per reservation agent space, and even if the airline wanted to add more agents, Heathrow has no room for it to expand. No mobile terminals that connect to Sabre would give the airline a way to move customers through lines quickly at peak times.

Handhelds could also be handy to schedule passengers in handle cup at international terminals.

American has been testing these applications at select airports and recently

rolled out another pilot. However, these pilot projects do not involve handheld computers. Instead, they use either an IBM PC Co. ThinkPad notebook with an external radio modem from Pacific Communications Sciences, Inc. or Gateway 2000, Inc.'s Handbook subnotebook with an external Sierra Wireless, Inc. radio modem.

No choice

One reason for using notebooks is that a rugged handheld with the capabilities American wants does not exist in the market.

"The things there lack reliability, and we're still trying to figure out what the real cost is," Kimball said. "We're not sure when we'll roll [the network] out [commercially], but we have to have a very, very reliable product."

Also, Kimball said reservation agents testing the systems surprised American by saying they wanted a keyboard. "We

thought they'd want a keypad, but they wanted the keyboard," Kimball said.

Another issue was the speed of the wireless network. American initially tested RAM Mobile Data USA L.P.'s Mobitex network, but found it transmitted its six to 30 seconds, which was too slow. American has been testing the Cellular Digital Packet Data (CDPD) protocol and has found it can send and return queries in two to seven seconds, which meets American's needs.

Of course, CDPD is not a finished network yet and will not be for some time. Even when it is, Kimball said it — like all the wireless networks, including the seemingly ubiquitous paging networks — will not offer full coverage in airports.

The airline will continue to develop a wireless Sabre connection, though its scheduled departure time remains uncertain.

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indeo Indeo™ video bolstered by a powerful 75MHz IntelDX4™ processor provides greater performance for smoother video playback.

10.4" The 10.4" color active matrix screen displays 65,536 (64K) simultaneous colors for stunningly realistic images and brilliant graphics.

810 MILLION BYTES Choose between a robust 810 Million Byte (= 772MB) or 520 Million Byte (= 500MB) hard disk drive configuration for storing large multimedia files.

Dual PCMCIA expansion slots (Type II and Type III) run simultaneously—with connection to your LAN, fax/modem and more.

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Computerworld Editorial Calendar

			Editorial & Sponsored Features	Show Distribution/ Bonus Circulation*
March 6	Feb. 17	Feb. 24	**Closer Look:** Enterprise Software Distribution Tools **Custom Publication:** White Paper on Object Technology	
March 13	Feb. 24	March 3	**CW Guide To: RISC Servers** Server Strategies: Short-term server purchases may be a matter of price/performance, but which systems make the most sense as long-term strategic platforms? Should users target different servers for every application or standardize on the best alternative? **Buyers' Satisfaction Scorecard:** Market leading RISC servers. **Firing Line:** Latest RISC server from a top vendor. **Custom Publication:** White Paper on Enterprise Application Development (part 1 of 4-part Enterprise Software Directions Series)	UniForum Dallas 3/14 - 3/16 Sterch Study
March 20	March 3	March 10	**Closer Look:** Object-oriented Development Tools	Object World Boston 3/20 - 3/23
March 27	March 10	March 17	**CW Guide To: LAN Management** Vendors continue to add more sophisticated management capabilities to their peer-to-peer LAN management packages. How well do they address performance, security and tracking issues. How do these packages fit under the companywide network management umbrella? **Buyers' Satisfaction Scorecard:** Market-leading peer LAN management packages. **Firing Line:** The latest software to consolidate LAN management for the organization.	Interop + Networld Las Vegas 3/28 - 3/30
April 1	Feb. 8		**Computerworld Client/Server Journal** **Vertical Market Focus:** Health Care **Section Feature:** Product Focus on Databases	AIIM Comdex Spring/ Harvey Windows World Study SIM Spring Conference DB Expo
April 3	March 17	March 24	**Closer Look:** PC Spreadsheets	
April 10	March 24	March 31	**CW Guide To: Document Management** Imaging and e-mail packages offer varying approaches to document management. Which approach is the most cost-effective and best fits your company's needs? How easily can documents be moved across platforms and applications? **Buyers' Satisfaction Scorecard:** Image processing packages for document management from the leading vendors. **Firing Line:** Evaluation of latest software conforming to new open document standards. **Custom Publication:** Windows World Open Supplement	AIIM San Francisco 4/11 - 4/13
April 17	March 31	April 7	**Closer Look:** IBM AS/400	
April 24	April 7	April 14	**CW Guide To: 32-BIT Operating Systems** Preparing your organization for 32-bit operating systems: How well do the leading products support enterprise requirements such as reliability, technical support and standards in their present and future products and strategies? **Buyers' Satisfaction Scorecard:** Operating system face-off: 32-bit systems. **Firing Line:** Latest 32-bit operating system for corporate users.	Comdex Spring/ Windows World Atlanta 4/24 - 4/27

IF A COMPUTER

CRASHED ON

YOUR NETWORK

WOULD YOU HEAR IT?

Received: 7/30/95 for
Client: Dylan Page

Description:

An Install Side Hard Drive replacement before actual

Alarm Details

Close | Next | Prev

NOT IF

IT NEVER

HAPPENED

Introducing the new Compaq Deskpro

ALARM DETAILS

...dg 7 Rm 202

...s imminent failure. Schedule
...re.

COMPAQ

| Action | | Help |

Managing computers on a network requires knowledge, skill and a bit of intuition. Okay, a lot of intuition. Somehow, you have to know what's going to happen. Before it actually happens.

Wouldn't it be great if you had a little help? A crystal ball? A sixth sense, perhaps?

Funny, we were thinking the same thing. So we built the new Compaq Deskpro. A computer that can report its status right to the desk of the network administrator.

HAVE COMPUTERS BECOME MORE HUMAN?

WELL, THIS ONE CAN TELL YOU WHO IT IS,

WHAT IT'S DOING, AND HOW IT FEELS.

Imagine being warned before a hard drive on another floor (or another city) seized up. Or taking a complete PC inventory right from your desk. (Certainly not the kind of cooperation you'd expect from a machine.)

We call it Intelligent Manageability. You'll probably call it "I'm glad someone finally thought of that."

How do we know? Maybe it had something to do with intuition.

COMPAQ.

Research proves what you've known all along: only 20% of the lifetime cost of your company's PCs is the initial cost.* The other 80% comes from all the things you do to manage them—such as configuring, servicing, upgrading and just keeping track of who's got what. Isn't it time someone found a way to change that?

Asset Management 101. The new Compaq Deskpro is the first PC that's as concerned about cutting costs as you are. It starts

the leading LAN management companies, we built in features that can easily be tapped by their new software tools.

And the result is stunning: Now, as network manager, you can look into a Deskpro PC anywhere on the network and get the facts you need. You can retrieve hardware specifications, including make, model and serial number for the PC, hard drive and monitor, and revision numbers for the system board and ROM. You can

things. With Intelligent Manageability, it alerts the user to key potential problems before they can turn into real ones.

Every time you power up the Deskpro, its IntelliSafe* hard drive takes a very close look at itself. If any of its performance parameters has fallen below acceptable standards, the user is notified. So instead of responding to a disruptive emergency, you have ample time to take corrective action—replacing the drive at no cost

COMPUTERS THAT TAKE CARE OF THEMSELV

with the Intelligent Manageability we mentioned a page ago: a Compaq-designed combination of hardware and software that gives you a new level of control over your networked PCs.

Until now, the only way to take stock of your PC assets was to physically visit each of your computers. At every stop, you'd have to examine the computer, take serial numbers, check software, open it up and take a look inside. A process that could literally take days.

With the new Deskpro, all of that changes. Working closely with

also identify system software and drivers.

It's not only good knowledge to have. It makes the process of maintaining and updating PCs vastly more simple.

Fire prevention. When people decide to stop working for you, they usually have the courtesy to give notice. PCs, however, seem to enjoy the element of surprise.

Again, Deskpro will be changing

under the Compaq Pre-Failure Warranty.*

In addition, our Environmental Fault Protection is constantly monitoring the internal temperature of your Deskpro to make sure it isn't working under conditions which might imperil your valuable data.

Networking is in our blood. Since setting up a PC on a network has turned into one of the most time-consuming pastimes in corporate America, the new Deskpro was built to streamline the process.

Right out of the box, it's configured for your

Introducing the latest line of Deskpro computers

*Source: Gartner Group

network, with a 32-bit PCI Ethernet NIC or an IBM Token Ring adapter already installed. The drivers are optimized and industry-standard connectors are in place.

With its simple configuration tools, Deskpro also reduces the frustrations of setting up desktop network software.

Under the hood. What makes Intelligent Manageability so appealing, of course, is the fact that it's built into an enormously powerful and efficient computer.

speed of our new QuadSpeed CD-ROM and CD-quality digital sound enabled by built-in Enhanced Business Audio.

Open and accessible. Needs change, goals change and people change. Fortunately, so can a Deskpro computer.

You can open it up without any special tools. The system board slides out, making it a simple matter to upgrade the processor or add extra memory. The PCI expansion slots are easily accessed. And the drive

they can actually consume less power.

(The savings in a month from one Deskpro probably won't finance your retirement villa, but the savings from many machines over many years should have a nice effect.)

And when Windows 95 is released, Deskpro will make the job of managing your company's PCs even easier. Using new management software tools provided by Compaq and our industry partners,

ES? THIS COULD TAKE SOME EXPLANATION.

With Deskpro, you can choose your processor, from a DX2/50MHz to the most powerful Pentium. And every model delivers the enhanced performance made possible by Compaq's new TriFlex/PCI architecture. In fact, in our latest crop of Deskpro computers, higher performance is something you can literally see and hear.

Thanks to PCI local bus graphics, you get crisp, responsive graphics even in everyday applications. (Select 586-class Deskpro models are available with higher-performance VRAM graphics.)

In multimedia models, you get the

cage swings out to make hard drive upgrades painless.

Plus, the Deskpro system board utilizes Flash ROM technology, allowing you to make future upgrades at the basic board level simply by running a software utility.

With the process of upgrading PCs reduced to mere minutes, you can spend your time on more lucrative pursuits.

Future dividends. And then there are the benefits you'll be reaping down the road. Since all Deskpro models are designed with built-in power management features that meet stringent EPA requirements,

you'll be able to monitor the health of all your networked Deskpro PCs—including the ones in your outpost six time zones away—without ever leaving your desk.

You'll be able to configure Deskpro so if IntelliSafe hard drive failure becomes a possibility, it will send a distress call across the network. Or automatically safeguard its data on a tape backup. You'll even be able to arrange for remote notification of potential problems with network interface cards or internal PC temperatures.

But then, what do you expect from a computer that takes care of itself?

The original premise was simple:
make a powerful, yet affordable,
computer that doesn't come

Introducing the new Compaq ProLinea   with all the headaches
normally associated with the word "value." And in
creating the latest Compaq ProLinea, we built on that
premise—by taking the original apart. We examined it
from the inside out, looking for ways to improve it.
Looking to see what new technologies we could add.

THE LATEST PROLINEA HAS AN

IMPRESSIVE SAVE FEATURE: IT'LL SAVE YOU MONEY,

SAVE YOU TIME, AND SAVE YOUR SANITY.

In the end, we came up with more than a few
improvements. Making ProLinea even harder to
distinguish from more expensive machines. The fastest
processors. Easy upgradability. Simplified maintenance.
Features that make it easy to live with on the day you
install it, as well as for years to come.

It all raises ProLinea to a completely new level.
(Of course you'll still find the price within reach.)
And that should certainly put your mind at ease.

COMPAQ

Traditionally, the phrase "better value" means someone has cut corners to give you a better price. At Compaq, we like to take a different approach.

The result is the new Compaq ProLinea: a family of computers that not only offers affordable prices, it pushes technology many steps forward. Twelve, to be exact: [Number One.] Our first improvement is something you'll notice before you even

peripherals. And guess what: Compaq already enhanced this standard with our new TriFlex/PCI architecture — built into every ProLinea model.

[Number Three.] The PCI architecture also boosts the performance of the graphics subsystem. Now, even if you're working with general productivity applications like word processors and spreadsheets, you can enjoy a crisp, responsive high-resolution

(along with Enhanced Business Audio). This gives you faster access to the rich, vast references available to businesses on CD-ROM today, from national directories to archives of business publications.

[Number Six.] However large a hard drive may be, there are those who take it as a personal challenge to fill it up. With the new ProLinea computers, however, we're determined to make that as difficult as

LIKE MOST PC BUYERS, YOU'RE

"BETTER VALUE," SO WE'VE CLEVERLY

buy a ProLinea. You get to choose exactly the processor you want—from very fast (486 DX2/50MHz) to blindingly fast (Pentium/100MHz). This way, you don't have to buy more performance than you need. And it's designed so you can upgrade whenever you want.

[Number Two.] You may be familiar with the new standard bus architecture called PCI. Basically, it improves upon the previous technology by expanding the data path to 32 bits and radically speeding the flow of information to expansion cards and

display. If your uses are more demanding, select 586-class models are now available with higher-performance VRAM graphics. [Number Four.] Forgive the acronyms, but there's also a PCI local bus IDE interface. This not only pays off in improved disk performance, it supports up to four storage devices. So whenever your needs demand it, you can easily add another hard drive, a tape backup or a CD-ROM drive.

[Number Five.] While we're on the subject of CD-ROM, multimedia ProLinea models now come with our new QuadSpeed drive

possible. You can choose a configuration with a disk capacity of 270MB, 420MB or 720MB. Any of which should put you comfortably ahead of your burgeoning files.

[Number Seven.] ProLinea comes with 8MB or 16MB of memory and, depending on the model, you can expand it to 136MB or 192MB—enough to take advantage of new 32-bit operating systems, run several programs at once and work with spreadsheets the size of Madison Square Garden.

[Number Eight.] ProLinea is filled with features designed to make your life easier. It's not

only pre-loaded with an extensive online help system and automated setup software, it now offers redesigned documentation to help you quickly pinpoint information. It's also optimized to run new operating systems, such as Windows 95, which will make your future computing easier still. Every model supports the Plug-and-Play standard that will bring a new simplicity to the process of adding expansion cards. (If

Number Ten. The new ProLinea computers have been designed so you can get inside without any special tools. The system board slides out to accept extra memory or a processor upgrade. The hard drive cage swings out so you can swap disks without having to reach into inaccessible, finger-bruising areas. And when you snap in a new Compaq hard drive, you won't have to configure any enigmatic jumpers. When

needed, installing them will be as simple as running a software utility and clicking a few buttons on the screen.

Number Twelve. What about the environment? Using a ProLinea won't by itself repair the ozone layer, but at least it's a step in the right direction. For the sake of the atmosphere — and everyone who breathes it — our manufacturing process is now completely CFC-free. And every

PROBABLY SICK OF HEARING
DISGUISED IT AS 12 IMPROVEMENTS.

you plug in a new network interface card, for example, ProLinea will sense the change in your setup and automatically reconfigure its software to support it.)

Number Nine. Now you can choose exactly how expandable you want your ProLinea to be. You can select a desktop model with three expansion slots and three expansion bays or a model with four of each. Or you can choose a five-slot, five-bay mini-tower model that provides maximum expandability without taking up too much of your space.

you connect the cables, the settings have the good sense to take care of themselves.

Number Eleven. The ProLinea system board now utilizes Flash ROM technology. That means basic system ROM can be updated without major PC surgery. If future updates are

model is Energy Star-compliant, which means less wasted energy for the planet and less wasted money on your power bill.

These are the improvements that define our approach to value. (It's a lot more rewarding than cutting corners.)

In fact, the new family of ProLinea PCs does an excellent job of expressing a core belief at Compaq: That is, the smartest way to build better value is to build a better computer.

Introducing the latest line of ProLinea computers

Microsoft Network shown; more info coming in July

A semiregular column with items of interest and amusement from the Internet.

Microsoft executives, while mum on the subject of pricing, gave a live demo of the Microsoft Network working with Windows 95 to a packed room at the annual PC Forum two weeks ago in Phoenix. The demo included a look at the link between the Microsoft Network and "shortcuts," a general-purpose feature in Windows 95. With shortcuts, users will be able to drag objects from the Microsoft Network to the Windows 95 desktop. Shortcuts also can be E-mailed to Microsoft Network subscribers. Russell Siegelman, general manager of Online Services at Microsoft, promised a fuller explanation of Microsoft Network APIs at a developer/content provider conference in July.

Internet access companies such as BBN Internet Services Corp. in Cambridge, Mass., are scrambling to gain market share before the Microsoft Network goes on-line in August. BBN recently announced it is going national and changing its name to BBN Planet Corp. The formerly regional Internet access provider will now offer connections at 500 locations nationwide with new 10M bit/sec. service in the Northeast, Southeast and Silicon Valley. The company also unveiled InterNet Advantage, a mixture of connectivity, security, training and consulting services geared to the corporate customer.

Meanwhile, UUNet Technologies in Fairfax, Va., last week expanded its dial-up access offerings with volume discounts of 25% to 40% for business customers with 100 or more users. About half of UUNet's customers now subscribe to its standard AlterDial service for $30 per month (15 hours free, additional hours $2.25/hour). UUNet, in which Microsoft holds an equity stake, is currently building the TCP/IP network for the Microsoft Network. The company said it will have nodes in 80 cities by spring and 150 cities by year's end. These nodes will support both 28.8K bit/sec. and 64K bit/sec. ISDN access.

New sites

• Must be tax season. The IRS says it will now accept your tax return electronically via the on-line services of CompuServe and America Online. Meanwhile, America On-

line says it has put IRS information, the "Ernst and Young Tax Guide" and other tax advice on-line for its subscribers. If that is not enough, you can get information and advice from the "Tax Wizard" at Hargrave & Hargrave in Los Angeles via a new World-Wide Web site at http://taxwizard.com. If you are really masochistic, you can find the entire U.S. Internal Revenue Code, in ASCII, at the U.S. House of Representatives. Just fanned over to gopher.house.gov (but be careful. You might meet a Newt in there.)

• An extension to NetWorld + Interop 95 Las Vegas, N + I Online, opened its doors March 13. The site, featuring exhibitor, product and conference information and interactive events, is available two weeks before, one week during and two weeks after the March 27-31 show in Las Vegas. The site can be reached at http://www.abcexpos.com.

• Not a new site but a goodie. On April 1, The WELL celebrates its 10th anniversary. The archives of The Whole Earth 'Lectronic Link, which today claims more than 11,000 subscribers, provide a wealth of information about how to create a diverse and self-sustaining virtual community. Touch its Web presence at http://www.well.com.

Just for fun

• Do you fit the definition of a "geek"? Check with Webster's Dictionary at http://c.gp.cs.cmu.edu:5103/prog/webster. The site includes hypertext hot-linked definitions.

Tips and tricks

• Notes servers will want to watch for Lotus InterNotes Web Publisher. A server application, InterNotes Web Publisher automatically converts Notes documents and views into HyperText Markup Language documents. The product will be released on Windows NT in the second quarter, according to sources. A second release, expected before the end of the year, will support Web forms and other server platforms. InterNotes Web Publisher will sell for $7,500.

Please keep us posted with your views, news and questions about items published in this space. Contact us electronically at citix@cw.com.

—Ellis Booker, Gary H. Anthes and Mitch Betts

Messaging spec readied

By Suruchi Mohan

Message management will take a leap closer to reality when the Electronic Messaging Association (EMA) publishes the Message Management Specification this spring.

The specification will address message tracking and dynamic monitoring. Both issues have been major concerns as large organizations that have many disparate systems trying to communicate with one another.

Message tracking, as the name signifies, allows the network administrator to trace the path of a message even if it goes across multiple platforms. Dynamic monitoring allows an administrator to see the operational status of every component on the messaging network.

"Monitoring is critical. Lots of sites don't have it," said Ken Sherman, member of technology staff at US West Communications, Inc. in Denver. "We had to build our own monitoring system" for the 10 messaging platforms that US West employs, he added.

Meeting users' needs

Some users said the vendors have finally grasped the message. "The vendors have heard our needs," said Darwin Sharp, electronic commerce advisor at Exxon Computing Services Co. in Houston. They seem committed to providing users with the functionality necessary to run an efficient messaging system, he added.

One user at a large organization said that not only will vendors implement the standard, but most will probably do more than the standard calls for.

The user, who did not wish to be identified, said it is important for all vendors to include agents in their software. Agents are key because they enable management solutions to gather and present information to the network administrator.

Corporations such as Hewlett-Packard Co. and IBM will also have to upgrade their management platforms to accommodate all the information they receive from agents.

The overwhelming cry at the EMA membership meetings has been for message tracking. There has to be a way to establish ownership when dealing with multiple vendors, Sharp said. The only alternative is to focus on one service provider.

"We have fairly intensive internal messaging, [but] we can't get that reliability outside the company," Sharp said. "There is relatively little consistency in the management and administrative tools available," he said.

Realistically, products will start rolling out within 12 months of the specification being published, said Sara Radicati, president of The Radicati Group in Palo Alto, Calif. in 12 to 18 months, she predicted, it will become a de facto standard.

Ben Horovitz, product manager for communications management at Lotus Development Corp. in Mountain View, Calif., said Lotus was not ready to commit to a date for when it will implement the EMA standard in its products.

Despite this, most observers agreed the most important thing is that the EMA is finally on the verge of publishing a specification that works across different technologies from different vendors. "This is a solid first step," Sharp said.

Safer electronic publishing pledged

By Ellis Booker

Folio Corp. used the annual PC Forum in Phoenix two weeks ago as the stage to announce its Information Marketplace, a delivery system for secure, copy-protected electronic content.

Publishers have been wary of cyberspace because of the seeming inability to protect intellectual property rights on-line, according to Curt Allen, executive vice president of Folio in Provo, Utah.

"Our goal is to make publishing on WANs as attractive as publishing on CD-ROM," he said.

Folio's solution involves several components. Key elements include the following:

• The Folio Infobase Technology, a popular format for CD-ROM publishing, for delivering content over low-bandwidth, client/server networks. Folio Infobase is an encoding and search engine that encodes content. Folio will be able to take all the publications that work with it already and put this content on electronic networks.

• The Folio Infobase Web Server, a $6,995 server available in the second quarter, for publishing Infobase files without modification on the World-Wide Web.

• The Folio Open Metering application pro-

gramming interface, which will provide both hardware- and software-based metering of content delivered over networks.

Technology aside, analysts said Folio's strongest card may actually be its current relationships with publishers. The 5-year-old company has relationships with more than 500 publishers, and its Infobase software is the delivery mechanism for some 2,000 electronic titles.

In addition, Folio is a minor unit of Lexis-Nexis, and both are owned by Reed Elsevier PLC. Lexis-Nexis is the largest commercial on-line database provider.

"They have a strong relationship with a number of publishers already, particularly in accounting and legal," said Mark Walter, an industry analyst at Seybold Publications in Media, Pa.

Seybold, like other publishers, is "wondering how to sell by the slice," Walter said, adding that the Folio model looks good on paper.

But Walter noted that some elements of the model, such as the transaction processing entity — the "clearinghouse" at the center of the Folio map — have yet to be clearly defined. Walter also wondered how open Folio's architecture would be and whether it would support a variety of software clients.

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MIND

Trinzic.

Rad Network Devices, Inc. has announced R-dapter, a Simple Network Management Protocol router adapter.

According to the Costa Mesa, Calif. company, R-dapter connects remote LANs to the enterprise via servers without requiring WAN cards and remote routing software.

The adapter has one Ethernet port, one WAN interface and a second port for automatic dial backup. When plugged directly into the second LAN interface port on a remote server, the product routes traffic from the server across the WAN to the second R-dapter LAN server.

Prices start at $795.

▶ *Rad Network Devices*
(714) 436-9700

StrataCom, Inc. has announced Axis, a network access component to BPX, its wide-area Asynchronous Transfer Mode (ATM) switch.

According to the San Jose, Calif. company, Axis improves BPX's frame-relay and ATM capabilities by providing aggregation and concentration of user traffic. One BPX switch with 16 integrated Axis units can support more than 15,000 frame-relay users at 64K bit/sec.

Prices start at $35,000 for a base system.

▶ *StrataCom*
(408) 294-7600

3Com Corp. has announced EtherLink III, a parallel tasking Peripheral Component Interconnect bus mastering network adapter.

According to the Santa Clara, Calif. company, EtherLink III independently reads and writes data to system memory, freeing up the CPU for other tasks.

The cards automatically install Novell, Inc.'s NetWare Universal Client and auto-selects the connector. Support for the Desktop Management Interface (DMI) is included for management of any DMI-compliant software.

EtherLink III costs $149 for a single adapter in a five-pack or $179 for a single Combo card in a five-pack.

▶ *3Com*
(408) 764-5000

Concord Communications, Inc. has announced WAN Health, network management software.

According to the Marlboro, Mass., firm, WAN Health gathers bandwidth utilization, error rate and router performance statistics. It supports rates such as T1/E1, T3/E3 and Synchronous Optical Network.

WAN Health costs $12,495 and comes as a module to Concord Communications' Trakker software.

▶ *Concord Communications*
(508) 460-4646

BlueLine Software, Inc. has announced Vital Signs VisionNet 4.0, performance management software.

According to the Minneapolis firm, Vital Signs VisionNet 4.0 provides an integrated view of network performance from LANs to multiple-host systems.

The product uses software agents to collect performance metrics from LANs, Unix systems, Simple Network Management Protocol devices and SNA systems. A performance database and report writer are included.

Prices range from $10,000 to $65,000, depending on the platform.

▶ *BlueLine Software*
(612) 542-1072

Product short

Sage Research, Inc. has announced Decision Works, a CD-ROM database of network products. Databases include scanned specification sheets, press releases and contact information. Cost: $850 per year. Sage Research, Natick, Mass. (508) 655-5400.

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Leasing firm reaps re-engineering rewards

By Thomas Hoffman

Business process re-engineering is getting a bad rap these days. Even some of the field's gurus are running around saying how the concept has been misunderstood and mishandled in many instances.

But Lease Plan U.S.A., an Atlanta-based leasing and fleet management firm, has proved that business process re-engineering can work. Since Lease Plan began re-engineering its corporate fleet operations in 1993, the firm has automated 40 manual steps while eliminating seven. Productivity has also skyrocketed from 320 cars per employee each month to 450 and counting.

Furthermore, a $650,000 investment in IBM's AS/400-based imaging technology is expected to let Lease Plan $2.5 million in cost savings during a five-year period. The savings is primarily due to the eight additional staffers the company did not have to hire to keep pace with its growing volumes.

Much of Lease Plan's success can be attributed to its ground-up re-engineering approach. "We broke down every in-

cremental piece of our business, where every piece of paper went and interviewed each departmental employee to determine how we could do it better," said David Bush, senior vice president of finance at Lease Plan, which leases 55,000 cars, trucks and pieces of construction equipment to corporate clients such as Sherwin-Williams Co. in Cleveland and Nestle S.A. in Switzerland.

The old way

Before the re-engineering effort, Lease Plan would print vehicle order confirmations and then mail or fax them to clients. "When IBM [consulting group] came in and did the initial assessment, we found that fully one-half our client services time was spent waiting at the fax machine," said David Bush, senior vice president of information technology at Lease Plan. "Not until IBM came in with an assessment did we have someone

Lease Plan's David
Bush: *I wean't comfortable with spending $600,000-plus and not knowing what I was getting.*

question our workflows, and that [finding] really opened our eyes," Bush said.

So early last year, Lease Plan followed IBM's recommendation and began installing an imaging system. Lease Plan's IBM ImagePlus system, which went on-line last September, operates on an IBM AS/400 Model F45 machine and feeds a network of IBM ValuePoint client workstations.

Meanwhile, Lease Plan's fax machines are guttering cobwebs now that the firm's customer services representatives are using digital fax software from UK-based CMA Edworth to streamline the transmission of customer paperwork. The digital fax system has gone a long way toward improving Lease Plan's employee productivity. The firm generates 300,000 to 600,000 new documents each year, Bush said.

The other imaging vendors that bid on the project declined to provide a detailed

front-end design of the system, a factor that weighed heavily in Bush's decision-making. Other vendors "claimed their products were good enough and could be tailored on the back end," Bush said. "I wasn't comfortable with spending $600,000-plus and not knowing what I was getting," he added.

Lease Plan's re-engineering gains are also evident in its improved customer services. "I see it in terms of the documentation they can get in an immediate turnaround," said Claudia Toth, fleet manager at Picker International, Inc., a Cleveland-based manufacturer of diagnostic imaging equipment. Beyond that, Toth said the firm has been more proactive than Picker's other longtime lessor, which she declined to name.

For example, Lease Plan uses a computerized marketing system that enables clients to find the most convenient location to pick up a car or have it serviced. Picker's other car lessor "has never made those kinds of suggestions to us," Toth said. Picker's contract with Lease Plan has swelled from 15 to 130 vehicles in the past two years because of Lease Plan's solid service, he added.

CAD/CAM

Mercedes picks Computervision for joint development project

By Neal Weinberg

The search took two years, spanned three continents and included eight vendors.

In the end, Bharat Balasubramanian and his team at Mercedes-Benz AG chose Computervision, Inc. in Bedford, Mass., to provide the computer-aided design and manufacturing (CAD/CAM) platform that the German car and truck maker hopes to ride into the next century.

Mercedes has committed 50 engineers to develop applications based on Computervision's object-oriented Pelorus architecture. If the joint development work bears fruit, Mercedes could eventually replace its estimated 2,500 to 3,000 seats of IBM's Catia design software with a Pelorus-based system, according to Charles Foundyller, president of Daratech, Inc., a consulting firm in Cambridge, Mass.

Mercedes is looking for a next-generation CAD/CAM system that will allow it to unify internal design operations, which are currently split between the company's

homegrown Syrko system and the Catia commercial design software, Foundyller said.

In the short term, Mercedes wants to weld its internal process with subcontractors worldwide because the company now outsources more and more of its design work.

Essentially, Mercedes wants to "build a better handover" using Pelorus as the application development environment, Foundyller said.

The goal is to speed up the time it takes to bring a new model car or truck to market, added David Burdick, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

Judging others

Balasubramanian, vice president of Mercedes CAD/CAM Competence Center, Documentation and Standards, said he spent a year visiting all the top automakers in the U.S., Japan and Europe to identify the best practices of each company. Then he hit all the major CAD/CAM vendors in the U.S. and Europe.

Companies were judged on their technology, vision and cultural fit. "It's a big step for any company — shift-

ing from one platform to another," Balasubramanian said. Mercedes selected Computervision because it scored the highest on pure technology and in the "soft areas" of vision and corporate culture, he added.

Pelorus is an object-oriented, event-driven development platform created for window-ing-based design automation applications, according to Ursula D. Wilson, an analyst at International Data Corp. in Framingham, Mass. And it supports open industry standards.

The joint development project will not be a major moneymaker for Computervision. "The real gold mine" will be selling to Mercedes' subcontractors, who hold an additional 3,000 design seats, Burdick said.

Another spin-off benefit for Computervision will be owning the underlying applications, which it can also sell to other automobile companies, said Blendin R. Ennis, an analyst at Hambrecht & Quist in San Francisco.

And Pelorus is not limited to the automobile industry. Merlyn Leslie, computer-aided engineering support manager at Andersen Corp. in Bayport, Minn., said he took a quick look at Pelorus. Andersen is the company that makes Andersen windows.

"It's a breakthrough so far as that type of technology," Leslie said. He said he was particularly impressed with the intuitive nature of the Pelorus design system.

Hard at work

Mercedes-Benz is providing 50 engineers who will develop applications on Computervision's Pelorus architecture for the next three years. That development work is valued at roughly $20 million.

Stanford steers digital library project

Demonstration targets financial transactions

By Michael Parsons

Researchers at Stanford University recently showed off a prototype intelligent agent technology that forms part of a $24.4 million digital library research project. The four-year Stanford effort is designed to access very different kinds of digital information, creating a virtual library from disparate sources.

The agent technology accesses three kinds of network resources and handles electronic payment.

Researchers demonstrated the system to funding representatives that visited the campus last month. "The funders did a site visit, and we demonstrated a way for clients and services to exchange money for goods in a convenient way," said Andreas Paepcke, a senior research scientist and project manager at Stanford. The demonstration showed a user querying three external databases.

The Stanford application runs on a mix of Hewlett-Packard Co. and IBM Unix workstations as well as on PC systems. It accesses the Knight-Ridder Information Services Dialog Service, which provides a computer magazine database; WebCrawler, a service on the World-Wide Web that indexes key words; and Inspec, a computer literature citations database.

At the center of Stanford's work is a technology called the Information Bus. Intelligent middleware that provides a common communications link between diverse services. Special programs, called protocol machines, will be developed to access specific digital libraries.

These programs will act as brokers between the Information Bus and various digital resources. Client interfaces will be developed that connect the end user to the Information Bus.

What lies ahead

"Our vision is of many, many anonymous publication-related services such as searching, copy detection or indexing, which are independently owned and run," Paepcke said. "The question becomes: How can the digital services work with each other, and how can clients exchange information between them?" Paepcke added.

The Stanford project is also attempting to find ways to reconcile different kinds of digital money — to become a distributed clearinghouse for financial transactions.

"One of the main foci is the 'glue' that enables these services to be enacted. Another is that you will only realize this vision if services can make money," Paepcke said.

The Stanford project is one of six digital library projects begun in October last year. The projects are a result of a joint initiative by the National Science Foundation, the Department of Defense's Advanced Research Projects Agency and NASA.

Parsons is a correspondent at IDG News Services' Boston bureau.

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Rascal-Datacom, Inc. has announced CMS 6000 5.1, a multivendor network management system.

According to the Sunrise, Fla., company, CMS 6000 5.1 is integrated with IBM's NetView for AIX. Together, the products let users select and seamlessly combine applications on a wide-area network.

The product includes a Multivendor Integration Toolkit that integrates proprietary third-party devices.

Prices start at $15,000.
► Rascal-Datacom
(305) 846-1601

Hyperion Software Corp. has announced Hyperion Financials 1.0, client/server accounting software.

According to the Stamford, Conn., company, Hyperion Financials 1.0 features a clean-slate design that lets users customize their work environments.

Modules include Ledger, Reporting, Admin and Tools. The software is optimized for each major database platform and includes drill-down, query-by-example, unlimited viewing and graphical report-writing features.

Prices start at $100,000.
► Hyperion Software
(203) 321-3500

Boole & Babbage Storage Division has announced Staged for Windows NT Server, a native backup operating system for Microsoft Corp.'s Windows NT.

According to the Conyers, Ga., company, Stage3 for Windows NT Server backs up servers using industry-standard local backup software.

Stage3 appears to users as a virtual tape device that transports data via Microsoft's SNA Server or the mainframe.

Prices range from $12,200 to $18,000 for the CPU component of Stage3 for Windows NT Server. The Windows NT component costs $2,900.
► Boole & Babbage Storage Division
(404) 493-8852

StorageTek Distributed Systems Division, Inc. has announced the Northfield Model 480 and 600 9838 disk subsystems.

According to the Lisle, Ill., company, Model 480 features 40-byte head disk assemblies (HDA) and 4M bytes of Fast Write cache.

Model 440 has a 2G-byte HDA and has optional 4M-byte Fast Write cache. Both models feature 16M bytes of read cache that is upgradable to $4M bytes.

Prices start at $44,625 for Model 480 and $32,600 for Model 440.
► StorageTek Distributed Systems Division
(708) 434-2476

Clovis, Inc. has announced the Multi-Star-8, a RAID storage system.

According to the Littleton, Mass., firm, MultiStar-8 lets users choose from RAID Levels 0, 3 and 5 and select a different RAID level to run concurrently on each of the four available arrays of seven drives. The system supports five 1.6-seven internal drives and is expandable to 28 drives and 112G-byte capacity.

Prices start at $12,160 for a 5G-byte system.
► Clovis
(508) 486-0005

Scopus Technology, Inc. has announced Scopus 3.5, customer-support software.

According to the Emeryville, Calif., company, Scopus 3.5 automates customer service, help desk, quality assurance, sales and marketing functions. It also adds support for Sybase, Inc.'s System 10, enhanced collaborative capabilities and improved memory management.

Prices range from $3,000 to $5,000 per concurrent user.
► Scopus Technology
(510) 597-5800

Altai, Inc. has announced Zeke Enterprise Scheduling 4.2 for MVS.

According to the Arlington, Texas, company, Zeke Enterprise Scheduling 4.2 centralizes all system activities and manages them as if they were run locally.

A Poly-Zeke function lets multiple copies of the software execute on a single MVS system to distribute scheduling to various sections of the organization. A ScheduleView facility has added support

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The objects of their desires

"I would like to see more integrated repository systems, as there are on Smalltalk systems, on C++. I'd like to see more multiplatform C++ compilers."

— JASON LIEBLICH, CS FIRST BOSTON

"It will be nice to see object-oriented tools that support actual code generation."

— JACK RABREN, GE CAPITAL MORTGAGE

"Smalltalk vendors are starting to address more platforms, and I want to continue to see more of that. They're strong on the client side but not on the server side, and that forces us to have a 'fat client,' which we're trying to get away from in client/server."

— JEFF HEARLEY, FIRST UNION NATIONAL BANK

"We'd like to see more development tools in the distributed object arena."

— JESSE DURAN, FIDELITY MANAGEMENT AND RESEARCH CO.

Language, other basics key to object success

By Elizabeth Heichler

When adopting object-oriented development, don't bother agonizing over which toolkit to buy because a tool kit alone won't guarantee success. Getting off on the right foot means starting with the fundamentals and choosing the right language and methodology, early adopters say.

Selecting a language is a profound decision that will shape the development group's style. As for methodologies, corporate information systems developers working successfully with objects agree that it is not so important which methodology they use, but that they stick with it throughout the project.

"Unfortunately, a lot of people adopt [object] tools, get in trouble and then go look for a methodology," said John Rymer, an industry analyst at Patricia Seybold Group, Inc. in Boston. The likely result of using object-oriented languages and tools without enforcing a development discipline is not being able to reuse objects — a key object-oriented benefit. Code

reusability requires planning and following rules, Rymer and other experts agreed.

A different approach

"The failure of object orientation has to do with the same reasons any IS project fails: inadequate training and poor management," said Jim Adamczyk, an Andersen Consulting partner involved in one

When is object-oriented development on the desktop likely to become standard at your organization?

It is a standard now

By the end of 1995

By the end of 1996

Can't predict, but expected to be a standard someday

Never

BASE: 503 RESPONDENTS; 2% DID NOT KNOW HOW THEIR DEVELOPMENT MIGHT CHANGE. TOTAL DUE TO ROUNDING.
Source: Computerworld Database Division, Framingham, Mass.

Adamczyk said. Andersen uses C++ as a power tool for developing technology infrastructure such as middleware. However, Andersen and most of its clients are using Smalltalk or Next for application development, he said.

One development organization that has had experience with both language and using C++ in CS First Boston in New York. That company found that "Smalltalk is great for prototyping but loses for production applications," according to Jason Lieblich, vice president of equity technologies.

At first, "we were a big Smalltalk shop," he said. But he found Smalltalk applications ran more slowly because the applications are partially compiled and interpreted at runtime.

But in early 1994, the group chose C++ because it needed a response across multiple platforms, and it wanted to go with a language that had more market share, Lieblich said.

And, indeed, C++ has deliv-

ered better performance, but it comes with its own set of caveats, Lieblich said. There are inconsistencies in C++ implementations.

For example, some vendors' compilers will not accept the use of C++ features such as templates, while others will. Also, the ability to combine different class libraries — essentially collections of object code components that can be plugged into applications — "has not begun to be addressed," he said.

No Smalltalk problems

GE Capital Mortgage in Raleigh, N.C., is also using C++ heavily — to develop financial applications — but for a different reason. "That's where we're able to hire and retain staff. It's a seller's market in Smalltalk," explained methodologist Jack Rabren. Of Capital Mortgage has not had any performance problems with Smalltalk, and Rabren's experience is that the bottleneck is

Object moves at Sprint

Two years into its move to object orientation, Sprint Corp. has reduced development time and increased the amount of code it can reuse.

When Sprint set out on its object-oriented odyssey, its goals were to build a set of object code components that could be used across a variety of different applications and help provide a consistent look and feel across the business. According to Liz LaValley, assistant vice president of business systems development at the telecommunications services company.

The move to objects has also helped Sprint roll out new services more quickly.

LaValley said. Its Sprint Sense flat-rate calling plan, launched in January, was "rolled out in three weeks," she said. Sprint's development cycle had been 40 weeks, but it has gradually decreased during the past couple of years as developers have been able to reuse more code.

Sprint chose the Fusion methodology from Hewlett-Packard Co. to provide some discipline for its object-oriented move, explained John Strand, director of technology planning and integration at Sprint's Network Design and Engineering Group in Overland Park, Kan.

The network management applications being built by Strand's group are

large and must be distributed, and he is finding that tools to support distributed object-oriented design are still fairly weak.

Another problem area, Strand said, is the lack of "open, published" interfaces to object-oriented development tools. "That is hampering us, so we're pushing vendors to provide us with interfaces to their systems so we can integrate them into our environment," he said.

Strand's group is primarily using C++ but has also begun using Smalltalk to build graphical user interfaces. He would like to see better integration between the two languages. "And we'd all like to get fully automatic code generation, but that's still a ways away."

— Elizabeth Heichler

Oracle plugs new product, pricing and packaging

By Kim S. Nash
BURLINGAME, CALIF.

Oracle Corp. unveiled a process modeling product last week along with new pricing and packaging options for some of its application development tools.

The move is part of an effort to better compete with Powersoft's PowerBuilder. Oracle officials said. Powersoft is a unit of Sybase, Inc.

In fact, Oracle's two new bundles of Cooperative Development Environment (CDE) 2 tools now offer features that most other client/server developers tools do not, said Mark Hamner, an analyst at Meta Group, Inc. based here.

CDE 2 is a modular set of several types of tools, including code generators, computer-aided software engineering (CASE) products and PC-based data modeling utilities. Larry Ellison, Oracle's president and chief executive officer, unveiled the bundles — dubbed Developer/2000 and Designer/2000 — at Code '95, Oracle's developer conference, held here (see chart).

Designer/2000, formerly known as CDE 2 CASE, includes a new graphical utility for modeling business processes and several other diagrammers is slated to ship next month.

Designer/2000 offers modeling capabilities not found in other client/server development tools, Hamner said. The ability to map out business processes and then generate applications from those models is old hat to mainframe developers using traditional CASE tools, Hamner said. But "the design stuff has been missing in client/server," he added.

Inside knowledge

Code '95, attendees got a sneak peak at the next release of Oracle's Forms generator tool, due to be announced in September. Among the notable features planned for Forms 5.0 is Project Voyager, which is the code name for a built-in software distribution feature that lets IS developers upgrade end-user applications created with Forms from a central server.

Developer/2000, meanwhile, is a bundle of CDE 2 generation tools. The package was designed to compete head-to-head with PowerBuilder. A Windows version of Developer/2000 products is available now, while Macintosh and Open Software Foundation Motif editions are due out this summer, Ellison said.

By bundling the various tools, Oracle hopes to make clear to would-be buyers exactly which Oracle products compete with the likes of PowerBuilder and other PC-based development kits, an Oracle spokesman said. CDE 2 components were formerly sold separately.

The company also wants to stop any more Oracle database users from choosing PowerBuilder development tools rather than Oracle's own. An estimated 30% of Powersoft's 100,000-customer base uses Oracle databases as back-end servers, according to Powersoft.

To help, Oracle has taken a cue from Microsoft Corp. and other low-end software makers and dropped runtime fees on all of its development tools. Where companies once had to pay as much as several hundred dollars per user, depending on the tool, deployment is now free. Powersoft did away with runtime charges several months ago.

Yet free runtimes may not be a big deal to customers building massive applications for thousands of users, said Rich Edwards, an analyst at Robertson, Stephens & Co., a brokerage firm in San Francisco.

The $100 or $150 per runtime license that some vendors charge "gets lost" at large installation systems shops already paying several thousand dollars for development tools, he said.

A bridge to separate tools

Implicit in Oracle's 2000 strategy is the concept of a repository where business and application models reside. As it stands, the company's CDE 2 CASE tools are largely separate from CDE 2 generation tools such as Forms and Reports.

A repository is key for making the separate tools easier to use, said Jeffrey Jacobs, an independent Oracle consultant in Belmont, Calif.

"You want to start with a modeler and never think about what product you're working with as you proceed," he said. "The whole thing ought to be seamless."

Larry Ellison, Oracle's president and CEO, conceded a slide show at Code '95 last week that showed a repository that would better unite the two facets, but he did not give details about that product or when it might ship.

— *Kim S. Nash*

2000 bundles
Oracle has announced new pricing and packaging for its tools

	WHAT YOU GET...	...FOR THE MONEY
Designer/2000	• Business Process Diagrammer • Other modelers	$3,995
Developer/2000	• Forms 4.5 • Reports 2.5 • Graphics 2.5	$3,995

Object success

CONTINUED FROM PAGE 73

often elsewhere, such as in the network or server.

Because both languages have their strengths and nuances, it is crucial to analyze your organization's skill set before you choose an object-oriented language, Rymer advised. If you have moved to C, then C++ has obvious applicability. But if you run a Cobol shop or use fourth-generation languages (4GL) heavily, then the move to C++ can be very painful, he warned, and programmers with those skills may have an easier time with Smalltalk.

In addition, Smalltalk forces programmers to write strictly object-oriented code, whereas programmers can use C++ and still write procedural code, according to Rymer and others experienced in the field. Thus, developers new to object-oriented code are automatically disciplined by using Smalltalk. But C++ developers can easily wind up with "spaghetti and meatballs" code — where the spaghetti is procedural C, entwined with the occasional meatball of C++ object, Rymer said.

That is where methodologies come in. By providing a framework for disciplined development, they keep developers out of the spaghetti and meatballs mishmash and on the straight and narrow path of true object-oriented design.

The right fit

"The methodologies are all by and large pretty good," said Jeff Headley, systems architect at First Union National Bank in Charlotte, N.C. He advised spending some time reading up on the most object-oriented methodologies, which include Shlaer-Mellor, Rumbaugh/Object Modeling Technique, Booch, Martin/Odell, Jacobson and Coad-Yourdon. It is important to select one that fits the culture and programming style of the organization, he added.

Joe DeToe, executive associate at Arlington, Va.-based consulting and services firm CACI, Inc., said his group evaluated quite a few of the popular methods and primarily uses Rumbaugh in the object-oriented arena. DeToe said his group found that Shlaer-Mellor was oriented more toward real-time systems, while Coad-Yourdon seemed to be stronger on analysis than on design and implementation.

An increasingly popular approach is to use a hybrid

of the popular methodologies, bringing in elements from other models as needed. Rabren said GE Capital Mortgage's method is based mostly on Rumbaugh, with some concepts from Jacobson.

What it all means

Object-oriented analysis and design tools	Automated support in the use of one or more methods for object-oriented analysis or design
Object-oriented programming tools and languages	Compilers and related programming tools for object-oriented 3GLs
	• Class libraries and frameworks
	• Objects as commodities (reusable components)
Object database management systems	Products that provide persistent storage of objects and have functions and features that are normally associated with database management systems

Source: International Data Corp., Framingham, Mass.

In fact, vendors such as Cadre Technologies, Inc., Intersolv, Inc. and Interactive Development Environments, Inc. are now supporting the use of hybrid object-orientation through the marriage of their analysis and design tools, reflecting the popularity of this approach, Rymer said.

Also, Booch and Rumbaugh are now working on a unified method that they say will incorporate the best elements of the object-oriented analysis and design methodologies.

A commitment to move

But do not oversanalyze the methodology decision, object-oriented veterans agree. The

key to getting started, said Steve Champert, vice president of Salve Decision Technologies in Dallas, is to "make the commitment. Get your people trained, pick a methodology and start with a project that is low-risk. And once you've got a core group of people exposed to object-oriented, populate your other development teams with them."

Microsoft revamps source code system

By Stuart J. Johnston

Microsoft Corp. is shipping SourceSafe Version 3.1, a source code control system for DOS, Windows, Windows NT and Macintosh.

Microsoft acquired SourceSafe last year when it purchased One Tree Software, Inc. in Raleigh, N.C., and is now reintroducing the package with a few additions. These include file conversion utilities for other source code control systems and a standard Windows installation utility.

Basically, SourceSafe provides an administrative control mechanism that creates a "lending library" for group programming projects.

Like other source code control systems, SourceSafe's main function allows developers to check source code modules out of the system in a manner that looks somewhat similar to the way readers check books out of a library.

When the developer who has "checked out" a source code file is finished working on it, he checks the file back into the system. As long as a specific source code file is checked out, a second or third developer cannot check out that file. Users, however, can opt to set up a SourceSafe differently and override this feature.

One of the features that makes SourceSafe different from other source code control systems is that most other systems manage code files only at the file level, said Dave Gold, vice president of

Key functions of Microsoft's recently acquired SourceSafe include the following:

- **Team coordination:** Assures that only one programmer at a time can modify a source file.
- **Version tracking:** Archives, tracks and retrieves multiple versions of code files.
- **Cross-platform development:** Eases porting to multiple platforms using a single code base.
- **Reusable code:** Aids in tracking programs that use the same modules.

Raleigh Group International, Inc., a valued-added reseller in Raleigh, N.C. SourceSafe enables developers to manage code at the project level, meaning an administrator can specify which code files are used in a particular program and manage them as a group.

SourceSafe is also the only package that provides support for DOS, Windows,

Windows NT and Macintosh in the same package, Gold said.

Mainsoft Corp. will release a Unix version of SourceSafe in the coming months, Microsoft said.

SourceSafe also tracks changes to a source code module in code programming session. Instead of storing each version of a file, which can quickly grow to require massive amounts of disk space, the source code control system stores only changes to the basic file.

Additionally, many source code control systems, including SourceSafe, allow the same source code module to be shared among several programs. This helps developers reuse general-purpose and object-oriented code modules.

SourceSafe 3.1 adds file conversion utilities for developers who used Microsoft's internally developed Delta source code control system, which the company stopped shipping at the end of last year. Microsoft will upgrade Delta users for the cost of shipping and handling and will continue to provide technical support for Delta through the end of this year, the company said.

Version 3.1 also includes a conversion utility for users of Intersolv, Inc.'s PVCS source code control system. SourceSafe costs $499 for a single-user license.

Progress Software Corp. has announced PowerPak Pro 1.0, a suite of Microsoft Corp. Visual Basic development tools.

According to the Bedford, Mass., company, PowerPak Pro 1.0 combines commercially available Visual Basic tools in one bundle, all supported by Progress instead of each separate vendor.

Development tools include Progress' QuickPak, VSVBX and VSView from Videosoft and Spyworks-VB from Desaware. Progress' QuickPak Pro provides database access and manages the results of large-scale queries. Starbase Corp.'s Version/VB provides source code management.

To manage resources and component versions, the product includes XRef from Progress, VersionStamper-VB from Desaware and VBCompress Pro from Whipplefare.

PowerPak Pro 1.0 costs $795.
▶ *Progress Software*
(617) 280-4000

Cognos, Inc. has announced Axiant 2.0, client/server application development software.

According to the Burlington, Mass., company, Axiant 2.0 lets developers deploy applications across different processors and over different topologies.

The product creates a deployment repository and document. Axiant 2.0 also incorporates Cognos' Impromptu and PowerPlay reporting and analysis tools.

Prices start at $2,995.
▶ *Cognos*
(617) 229-6600

Magec Software has announced MAGEC (Mask and Application Generator and Environment Controller) 3.0, cross-platform graphical user interface development software.

According to the Dallas company, MAGEC 3.0 adds a developer's menu that provides a graphic depiction of the tasks needed to develop applications and guides the user through the process.

On-line tutorials and application programming interface support for communicating with other applications is included.

Prices range from $2,000 on the PC to $125,000 on the mainframe.
▶ *Magec Software*
(214) 495-3000

ALI Technologies, Inc. has announced ALI Design Analyzer 1.1, a design utility for Notes.

According to the Needham, Mass., company, ALI Design Analyzer 1.1 lets

users view the design elements of a Notes database and shows the dependencies of other Notes resources when database replication identifications and server databases are encountered.

The product exports the design elements to a separate Notes database. Beginner and expert database templates are included.
▶ *ALI Technologies*
(617) 455-4910

DEK Software International has announced Virtual Media Hypertext Development Kit (HDK) 2.5, Windows hypertext authoring software developed by Virtual Media Technology Ltd. in North Sydney, Australia.

According to the Cherry Hill, N.J., firm, Virtual Media HDK 2.5 lets users create Windows context-sensitive help systems and user manuals.

The product generates source code by converting documents into hypertext systems. Features include full text indexing, special pop-up glossaries, 256-bit color, animation, audio and watermark bit maps.

Virtual Media HDK 2.5 costs $399.
▶ *DEK Software International*
(609) 424-6565

Blue Sky Software Corp. has announced RoboHelp 3.0, a help authoring

tool for Windows.

According to the San Diego company, RoboHelp 3.0 comes with a WinHelp Video Kit that lets users capture on-screen actions and create video product demonstrations and tutorials that can be integrated into the help file.

The product lets users display special Microsoft Corp. WinHelp features in Windows Help, such as smart quotes, bullet lists and hanging indents.

RoboHelp 3.0 costs $499.
▶ *Blue Sky Software*
(619) 459-6365

Expersoft Corp. has announced XShell 3.5, a distributed object management environment.

According to the San Diego firm, XShell 3.5 has added an XShell Replica Id Namespace module, an XShell Simple Network Management Protocol (SNMP) Agent and an XShell Interface Definition Language compiler.

The product also supports integration with Rogue Wave Software's Tools.h++ class library and Microsoft Corp.'s Foundation Classes.

XShell Replicated Namespace costs $500 per managed XShell module, and XShell SNMP Agent costs $2,500 for the developer's tool kit and $250 per managed node.
▶ *Expersoft*
(619) 546-4100

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Management

SCOPE

By Alice LaPlante

GROPE

Odds are that your latest IS project could end up a runaway train — over budget, behind schedule and out of control. But get caught up in the myths of project scope management and you can really be in trouble.

YOU CAN'T UNDERSTAND IT. YOU DID EVERYTHING RIGHT.

After being handed responsibility for that important information systems project for the widget department, you read dozens of books, attended seminars and conferences and otherwise immersed yourself in the latest project management tools and techniques.

Yet you still ended up with a project that missed its deadline by six months, went over budget by 80% and accomplished only 70% of what it was supposed to do.

What happened?

Simple. You got hit with the political and organizational realities of managing a project within a living, breathing business.

Good project scope management skills are becoming recognized as the heart of any successful project. As defined by Webster's, a scope is "extent of treatment, activity or influence; range of operation." As defined by the Project Management In-

stitute, scope management means "ensuring that the project does all the work required — and only the work required — to successfully achieve the purpose of the project.".

As experts point out, it's possible to do everything by the book only to find things written between the lines that you somehow missed.

"There are the technical issues of controlling projects, where you've got these very bona fide models and methodologies and tools to help you. Then you have your sober political and organizational issues, which turn out to be equally important," says Joan Knutson, president and founder of Project Management Mentors, Inc., a project management training and consulting company in San Francisco.

With each step you take, Knutson says, no matter how technically accurate you try to be, "you've got the potential for serious generalizations and misunderstandings that can impact the success of your project."

SCOPE GROPE

Indeed, if record survey of 150 corporate IS managers by the Center for Project Management, a consultancy in San Ramon, Calif., shows that half or all IS projects become runaways — project managers overshoot their budgets and timetables while failing to deliver fully on their goals. Then there are the really unfortunate IS project managers, the 25% who end up with projects so out of control that the projects are killed outright — but not before dragging on for a very costly average of 18 to 24 months of design and development work.

out contingencies and responsibilities — often in a graphical way, such as flowcharts and Program Evaluation and Review Technique (PERT) charts — can be very useful, "being a successful project manager in IS does not simply mean devorating your office in copy PERT chart," she says.

Here are six myths of scope management that you'll be better off debunking — and the sooner the better:

Myth #1

As long as users are involved, you're assured of delivering an IS project grounded in the realities of their business needs

Reality:
All user involvement is not created equal.

All too often "user involvement" takes the form of a vaguely stated idea from a senior manager in the user community. Moving from this fuzzy concept stage to a more concrete realization of what the project entails is fraught with danger —

"But I didn't mean that.'"

Even if the senior "concept" manager hands off responsibility to an active user committee, tread very carefully. Consultants and IS project managers warn. After all, the users may not understand their manager's idea, and they might have as much trouble getting time on their calendar as the IS manager

Which is why Diana L. Garrett, IS program manager at Intel Corp. in Santa Clara, Calif., always insists on senior management involvement in the user process. "This is not just about talking to users," she says. "It's about talking to the right users." Garrett says she won't proceed with a project until she is assured that a senior manager — indeed, the one who must take ultimate financial responsibility for the success of the project — is actively involved. Forget involvement by proxy, she says, the stakes are too high.

This also solves another common user-involvement problem, a too-democratic approach to defining the scope of the

fectively and tend to get further confused by jargon-laden discussions and documents. Scope exclusion will root out mistaken assumptions by both parties.

"When setting scope, you are putting a fence around what is being required of the project," Knutson says. "And remember that fences are as frequently used to keep things out as to keep things in. The clearer you can be about this, the better off your project will be."

Myth #2

Once you have defined the scope of the project, hold firm: Any deviation from the original plan is a sign your project is getting out of control.

Reality:
It is inevitable that scope will change. Plan on it.

In fact, a bigger problem for IS is when schedules and cost estimates are set too early — before enough details about a project are known — and then considered written in stone by senior management.

Instead, IS should plan on a fluid and iterative approach to defining scope. Early estimates should be reconsidered and revised as project parameters become clearer. IS managers should not be afraid to go to the project sponsor and present newly acquired evidence that the budget or schedule is unrealistic.

"Scope management is, by definition, a process of discovery," Tuman says. As a project progresses, a good manager will quickly and efficiently uncover the things that weren't identified earlier and deal with them effectively.

"I've yet to see a project where even a fully researched and well-documented scope statement didn't change as we went forward," says Andy Cables, project manager of business systems at Shell Oil Co. in Houston.

In effect, good scope management is good change management: You've put a clearly defined process in place to deal systematically and effectively with the inevitable surprises and discoveries that unfold.

At some point, of course, a formal "scope document" attempts to nail down the project's schedule, budget and functionality. After that comes the change-management process and the power to

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> "Beware of 'scope on a rope.' It'll be sure to hang you in the end."
> — Gopal Kapur, president, Center for Project Management, on the dangers
> of a seemingly friendly, open-ended invitation to embark upon a new IS project

The term "scope creep" has been used to describe cases in which significant systems changes are made after project requirements supposedly have been decided and actual development has already begun. Many IS project managers, however, make the mistake of characterizing as scope creep any additional demands made by naïve or aggressive users. In fact, the reasons for runaway projects are much more complex and insidious.

Take heart: There are solutions that can minimize the "soft" dangers associated with scope creep. But you probably won't find them on a flowchart or in your PC-based project management software documentation.

"Finding the right project management or estimation tools gets you only 10% there," says Arik Paran, vice president of customer support services at Cadence Design Systems, Inc. in San Jose, Calif.

Knutson agrees. While tools that map

especially if the original "concept person" is too busy to discuss details.

"Here is where your real project management work begins," says Jeff Korukay, program manager for global project management at Honeywell, Inc. in Clearwater, Fla. Korukay is putting together project management guidelines to be used throughout Honeywell's IS operations. "You must pin your user down — immediately. Otherwise, you'll waste a good deal of time second-guessing right from the start of the project. That's a red flag," he says.

An end user who seems genial and accommodating is all the more reason to beware, says Gopal Kapur, president of the Center for Project Management. "Beware of 'scope on a rope.'" he says of the dangers of a seemingly friendly open-ended invitation to embark upon a new IS project. "It'll be sure to hang you in the end."

Almost inevitably, Kapur says, there comes a time "when that user will say,

project. "If there's no senior manager involved, and you've got a committee of user peers where everyone gets to put in their vote, your project easily can be held hostage by the users," Garrett says.

Myth #2

The primary purpose of a "scope statement" is to state clearly what your project will do.

Reality:
A complete scope statement will also make clear what the project will not attempt to do.

"Scope exclusion is very important," says John Tuman Jr., president of Management Technologies Group, Inc. in Morgantown, Pa., a project management training and consulting firm. "Saying, 'No, we don't intend to address this particular problem' is critical when clarifying roles and responsibilities."

This is particularly true in IS projects, Tuman says. Users and IS workers have traditionally failed to communicate ef-

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Source: 1994 survey of 150 IS project managers, Center for Project Management, San Ramon, Calif.

25% of projects are canceled due to scope increase	Less than **15%** of IS project managers have created a change-management plan to deal with scope changes
50% of finished projects are over budget by **60%** to **190%** and contain less than **70%** of originally promised functionality	
25% of projects are completed on time, within budget and to a client's satisfaction	Less than **11%** of IS project managers know the critical paths of their projects

SCOPE GROPE

grant formal approval to any additional scope changes.

Typically, that involves a change-management committee, usually made up of senior managers from the user and technology communities. Any proposed change is presented to this committee, which then decides if an additional feature or requirement should be added to the previously defined scope.

But beware of solidifying the scope document too early in the process, Kapur warns.

In the Center for Project Management's 24-step project management methodology, for example, a "desired scope" is tentatively laid out in Step 1; a "candidate scope" containing actual schedules and deliverables is set in Step

So-called "suit factors" can make even the most well-planned IS projects. Characteristics of unsuccessful projects can include the following:

Excessive or unrealistic pressures

Severe friction with clients

Divisive corporate politics

Naive senior executives

Source: Software Productivity Research, Burlington, Mass.

> "There are the technical issues of controlling projects, where you've got these very bona fide models and methodologies and tools to help you. Then you have your softer political and organizational issues, which turn out to be equally important."
> — Joan Knutson, president, Project Management Mentors

12; and a "reconfirmed scope" is finalized in Step 20, when final cost estimates are set.

"And of course, the scope must be reviewed continually during ongoing progress reviews — what we call our iterative Step 22, which comprises the change-management portion of our methodology," Kapur says.

Myth #4

The man job of a change-management committee is to arbitrate user requests for additional features or functionality beyond the original project charter.

Reality:

Scope problems go well beyond additional user demands.

"If you fall behind your schedule, that's a scope change. If you're over budget, that's a scope change," says Ray Ju, a senior project manager at Wells Fargo Bank in San Francisco.

Ju likes to use the "triple constraint" model to visualize change management. Think of your overall project scope as a triangle: One side represents the project goals (the features and functions), another side represents the immediate and the third side represents the needed resources, such as cash outlays, labor and equipment.

"It's fairly easy to see that when your user requirements change — when they request additional features, for example — that either the schedule or the cost or

both will be affected," Ju says.

But project managers often fail to realize that either a schedule change or a budget change can have an equally profound effect. "If your schedule slips, then you have to either devote more people to the project, and that affects your costs, or eliminate functionality," Ju says.

In short, any change to the original plan — whether goals, timetable or costs — requires that a choice be made by the designated change-management committee. During that process it is important to make sure the project doesn't get off track while the change-management

committee is debating a particular change.

Jim Willbern, president of The Willbern Group, a project management consultancy in Little Rock, Ark., recalls being brought in to arbitrate an outsourced Canadian IS project. A substantial scope change was being discussed by the customer's steering committee. The prescribed change-management process was working in the sense that it had been triggered by a proposed change in scope, but in the meantime, the IS contractor was continuing work per the original contract terms.

"The scope changed. They were having trouble agreeing on a solution, and the contractor kept plunging on the eventual tune of a $25 million overrun," Willbern recalls.

It is therefore critical to define what should be happening while the change-management committee discusses changes in the project, Willbern says.

Myth #5:

Holding regular and frequent meetings for senior managers will ensure they are kept up to date on the matters of the project and that you maintain their goodwill and support.

Reality:

It's hard to be sure they're really listening.

Garrett points out that you can put a great deal of effort into frequent communiqués with senior management and still be ignored until it's too late.

"Senior managers can get busy and preoccupied," Garrett says. "It can be very difficult to get their attention. You can drag them into meetings, and they can sit there and seem to listen and still not really comprehend what's happening with a project."

"To get people's attention, you must be very clear about explaining what's in it for them," Tunnan says.

At the very least, Tunnan says, this means eliminating jargon and technical references from progress reports. Loading a finance manager down with talk about function points or object-oriented programming techniques isn't likely to hold his attention. But explain how adding a certain report to the project will improve accountants' productivity and you stand a better chance of ensuring management involvement.

Kapur warns of the perils of casual encounters with senior managers who haven't been paying attention at meetings but "suddenly have lots of suggestions for you" when they see you in the hall.

"I always say, 'Never ride in the elevator with a sponsor.' It always leads to trouble," Kapur says.

The best thing to do in such cases, Kapur says, is point out that there is a formal structure in place to discuss the status of or changes to the project.

Kapur says CEOs often don't realize how much pressure they put on project managers. "One thing project managers need to do is learn to push back," he says.

A good project management process, Knutson says, will "give you the ammunition to push back when you have to. Then when you get asked pointedly in the wrong place, you have the data at your disposal to make a business case."

Myth #6:

If schedules or budgets slip slightly, you have a good chance of catching up later. There's no need to ring alarm bells unnecessarily.

Reality:

Bad news is never welcome, but it goes down easier earlier than later.

"A slip is a slip is a slip," Garrett says. "Don't ever count on catching up later. It's not going to happen."

Ju shares that view. "Before there's smoke, there's fire. Projects don't fail overnight," he says. Project managers must therefore look for early warning signs and be candid with their superiors about the implications of even minor setbacks.

"It's your responsibility to report the facts. Your customer can decide what action, if any, to take about it," Ju says.

And don't hesitate to call daily meetings for projects in which schedules are slipping and deliverables are missed, thus ensuring that customers aren't handed any unpleasant surprises, Ju advises.

But here arise cultural issues that have nothing to do with project management methodology, Willbern warns.

"You might well belong to an organization in which bad news gets you killed," he says.

The fear engendered by this shoot-the-messenger culture can seep to the lowest levels of your project team. You might well have trouble getting accurate status reports from subordinates who still hope they can catch up and avoid punishment.

"If that's the case, then you have a serious problem that no amount of project management theory can solve," Willbern says.

Myth #7:

The bigger the project, the more problems you will encounter. If in doubt, always break a larger project into multiple smaller ones.

Reality:

There can be substantial economies of scale resulting from enlarging the scope of an IS project.

"The problems with managing larger IS projects have been fairly well documented," says Chris Kemerer, the Douglas Drane associate professor of information technology and management at MIT's Sloan School of Management in Cambridge, Mass.

But what is less well understood, he says, is that you might actually want to make some software projects larger in order to increase overall IS productivity and be able to take advantage of certain technology cost efficiencies.

This is common practice in IS maintenance projects where it is fairly standard to "batch up" small requests for systems changes and enhancements until you have enough to justify a new release.

"The reason is obvious: It's going to cost you so much every time to go into an existing system, make a change, test it and roll it out to your users; therefore it makes sense to accumulate changes and spread those fixed costs across more activities," Kemerer says.

"It's against prevailing wisdom, but our research shows that companies should explore the possibility that larger is sometimes better," Kemerer says. ■

LaPlance is a freelance writer in Woodside, Calif.

The Associated Grocers of New England, a retail-owned grocery distribution center in Manchester N.H., has appointed David Hayes director of information services. He will report to Executive Vice President Dick Ennis. Prior to his appointment, Hayes was director of MIS at Windsor Wholesale Corp., director of information systems at Roberts and Associates and vice president of information services and Purity Supreme in North Billerica, Mass. He has handled all phases of data processing, office automation, telecommunications and applications of sophisticated order entry, sales support, warehouse distribution, purchasing and operational reporting.

The U.S. Securities and Exchange Commission has appointed Michael E. Bartell associate executive director of information technology. He will oversee the use of all automated systems and processes. Prior to his appointment, Bartell was director of the U.S. Senate Computer Center, providing a full range of automation services to more than 120 Senate offices in Washington and 300 state offices. Before that, he served in various computer-related positions at the U.S. departments of Commerce and Treasury

General Medical Corp., a medical supplies, equipment and services distributor in Richmond, Va., has appointed **Frank Massey** vice president of information systems. Massey's appointment marks his return to General Medical, having worked there from 1980 to 1987 as director of MIS. In the years since, Mas-

say will be responsible for all of General Medical's computer systems, including one mainframe in the corporate facility and approximately 50 network systems in the field. He will head an IS department that provides computer services to 3,000 corporate and field employees and 20,000 external customers. Prior to his appointment, Massey was senior vice president of MIS at Medaphis Corp. in Atlanta, a leading provider of business management services for physicians and hospitals. Before that, he held the same position at Investors Savings Bank in Millburn, N.J.

The National Association of State Information Resource Executives announced that association member Don Heiman of Kansas was appointed acting director of the Division of Information Systems and Communications for the state of Kansas. He replaces Jean Turner who recently resigned. The association also announced that member Richard A. Walsh of Pennsylvania has resigned as special assistant to the gov-

error for telecommunications and technology systems. A replacement has not been named.

Sarii Kraus, visiting professor at the University of Maryland Institute for Advanced Computer Studies in College Park, Md., has been awarded the Computers and Thought Award from the International Joint Conference on Artificial Intelligence. The award is given every other year to "an outstanding young artificial intelligence researcher" under the age of 35.

Since joining the Institute for Advanced Computer Studies, Kraus has focused on research related to cooperation and interaction among negotiation agents, which led to the development of a strategic model of computer systems negotiation designed to achieve mutual benefits. She is a leading authority on how to automate the process of negotiations by computers and a leading researcher in the area of multiagent planning, deductive databases and nonmonotonic reasoning.

Calendar

Getting help with IS unpleasantries

Looking for tips on taking control of negotiations with software vendors and suppliers?

Do you want advice on how to conduct fair and useful information systems employee performance and team evaluations? Do you need help legally firing that technologist with the bad attitude? Or maybe you're struggling with how to manage the "ugly" side of your IS department.

These are just a few of the issues that will be addressed in the spring and summer courses offered by the

American Management Association. The association is offering nearly two dozen one-day courses. Topics range from basic supervisory skills to customer service. IS-related courses range from fixing pesky PC problems to design basics with desktop publishing. Each course will be held in a variety of cities and on several dates.

For a course catalog or information, contact Padget Thompson, a division of the American Management Association, P.O. Box 2067, Overland Park, Kan. 66201 or call (800) 255-4141.

APRIL 2-8

SAS Users Group International (SUGI) Conference. Orlando, Fla., April 2-5 — Topics include Implementing Cross-Functional Financial Consolidation Systems, Issues in User Data Access and Reporting and Regulatory Approval. Contact: SUGI 20, Cary, N.C. (919) 677-8000.

Seventh Annual National Managed Health Care Congress. Washington, April 2-6 — Contact: National Managed Health Care Congress, Burlington, Mass. (617) 270-6000.

The 15th Annual Conference and Exposition of the Information Systems Security Association (ISSA). Toronto, April 2-5 — Conference theme, "Learning From Each Other," will be conveyed through topics such as security awareness; client/server, distributed computing security; telecommunications/network security and vendor security solutions. Keynote speakers include Terry F. Lenzner, chairman of Investigative Group, Inc. in Washington. Contact: Lou Komara, ISSA International, Glenview, Ill. (708) 699-6441.

Infocon '95. The Conference on Computer Communications. Boston, April 2-6 — Contact: Celia Desmond, Senior Resource Center, Inc. Mississauga, Ontario (905) 615-6507.

Application Development Conference & Exposition. New York, April 3-6 — Topics include "Enterprise Client/Server Development," "Building Enterprise Reliable Systems," "Object-oriented Strategies and Enterprise Development," "Project Championship," "Enterprise Application Architectures," "Transitioning Legacy Systems to Client/Server" and "The Year 2000: Problems and Solutions." Contact: Software Productivity Group, Northboro, Mass. (508) 393-7100

Data Warehouse & Decision Support Systems '95. Rockville, Md., Arlington, Va., April 3-6 — Sponsored by Barnett Data Systems. Fees: One or two attendees is $1,295 per person; three to nine attendees is $1,090; 10 or more is $895. The exposition costs $25 per person. Contact: Barnett Data Systems, Rockville, Md. (301) 762-1296.

COMMON Spring '95. Las Vegas, April 3-7 — Sessions will cover three general categories: industry/application, management and systems. Contact: COMMON, Chicago, Ill. (312) 644-6610.

Introduction to Globally Scalable Parallel Computing. Ithaca, N.Y., April 4 — Contact: Cornell University's Engineering and Theory Center, Ithaca, N.Y. (607) 254-8686.

Application Development Conference & Exposition. New York, April 4-5 — Free. Three-day fall conference and exposition package is $750 one-day attendance is $300. Contact: CMP Applications, Inc., New York, N.Y. (516) 733-6700.

Training a Team-Based Organization. Nashville, April 5-7 — Sponsored by the Association for Manufacturing Excellence (AME). Fees: $750 for AME members; $825 for nonmembers. Contact: AME, Wheeling, Ill. (708) 520-3282.

From Form to Function Symposium. Edison, N.J., April 6 — This symposium will cover "Electron-

ic Forms Design and Distribution," "Paper Management and IS Relationships," "Workflow Enhancement Technologies" and "Imaging Systems with Forms Automation." Contact: Spectrum Systems & Resources, Inc. Parlin, N.J. (908) 727-1112, Ext. 9.

Re-engineering Business Processes Through Information Technology Conference. Cambridge, Mass., April 6-7 — Contact: Joanne Arnett, Center for Advanced Technology, Inc. Medford, N.Y. (800) 660-1753.

APRIL 9-15

American Management Association's 66th Annual Human Resources Conference & Exposition. New York, April 9-12 — Fees: Member rate is $1,080; nonmember rate is $1,195. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699.

Innovative Thinking Conference for Both Sides of Your Brain. Santa Barbara,

Calif., April 9-12 — Keynote: Mike Vance, author of the St. Paul Saints; Margaret Wheatley, Ed.D., author of *Leadership and the New Science*; Doug Hall, author of *Jump Start Your Brain*; George Land, co-author of *Breakpoint and Beyond*. Fees: $1,495 for nonmembers; $1,295 for Innovative Thinking Network (ITN) members. Contact: ITN, Santa Barbara, Calif. (805) 964-5363

AIIM '95. San Francisco, Calif., April 11-13 — Contact: Association for Information and Image Management (AIIM). Silver Spring, Md. (800) 477-2446.

APRIL 16-22

Embedded Systems Conference East. Atlanta, April 18-20 — Ports in an embedded systems products and services. Exhibits cover the full spectrum of development tools, hardware products and services for embedded design. Contact: Miller Freeman, Inc. San Francisco, Calif. (415) 905-2334.

APRIL 23-29

The Evolution of Object Methods. Chicago, April 24, New York, April 25; Dallas, April 27; San Francisco, April 28 — Attendees will learn about the unification of object-oriented methods and the state of object methodologies. Contact: Rational Software Corp., Santa Clara, Calif. (408) 496-3600.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

Unflagging technology activist Gordon Bell previews
a future in which plugging in to a worldwide
network is as easy as getting a dial tone

THE VIEW FROM HERE

By Gordon Bell

Bell is creator of the Digital Equipment Corp. VAX and founder of the Computer Museum in Boston. This week he is also Computerworld's publisher, a position he won as highest bidder at last year's Computer Bowl fund-raiser.

imes Square. Midnight. 1999. A thunderous roar fills the air as the crowd celebrates the new millennium. Few in that New York crowd may be aware, however, that a lot more than just their calendars will change. In the year 2000, a momentous leap forward in computing will begin as pieces of a ubiquitous environment of scalable networks and platforms start to sprawl.

How sweeping a computer evolution the year 2000 ushers in will depend on the speed of technological advancement, our own willingness to adopt standards and the vagaries of vendors.

There will be plenty to ooh and aah about when we greet the new millennium: increased reliance on standard platforms, operating systems and Asynchronous Transfer Mode (ATM) networks; new "mainframes" made of stacks of linked PCs running Microsoft Corp. Windows NT and SQL-based databases all connected to a high bandwidth switch; some consolidation of the flavors of Unix; and, perhaps most important, a worldwide dial tone of sorts that will encompass telephone, videophone, videofax and computers and that will let anyone communicate with anyone else anywhere in the world.

It all boils down to what I call SNAP — or scalable networks and platforms — a term coined by me and Jim Gray, a professor at the University of California at Berkeley.

From a systems architect standpoint, scalable networks and platforms will enable users to have only one system — a worldwide network — that will equate to a second-generation Internet, or Internet II. In this Internetwork, systems will offer peak speeds of more than 1 billion instructions per second.

For Internet II to happen, users need get wide-scale, fully symmetric 25M bit/sec. communications (at least) at the price of Integrated Services Digital Network (ISDN). T1 lines may be the answer, if the telecommunications providers make T1 available on an Interim basis for the same price as ISDN. For about $10k billion, telecommunications companies can build Internet II so it goes to every phone jack worldwide.

Full realization of scalable networks and platforms can happen within 10 years — if the telecommunications companies cooperate. The communications industry, while having the most technology, always seems to end up underperforming my already low expectations.) Specifically, the following technology pieces need to converge:

DRIVER:
PC powerhouses
Time frame: 2000

When the year 2000 arrives, 32M bytes on a single chip will be the norm.

Processors will likely be running at 400 MHz to 1 GHz. Two-and-a-half-inch magnetic disks will be less than 5 cents per megabyte and hold 20G bytes of information — about 10 hours of video or 20,000 books.

The sheer power of the microprocessor and increased magnetic capacity will enable the PC to emerge as the most incredibly flexible product component civilization has ever had. PCs may be harnessed as ultrapowerful worldwide nodes on the desktop, wristwatch-size personal digital assistants, voice-activated computers or television/computer combinations in the home. Each machine would order and install its own software and be maintained remotely.

Will credit-card-size computers link to public I/O devices and carry a user's personal databases? Sure, that's possible; at the very least, credit cards will contain memory and a processor to identify the card's owner and protect its contents. They may even carry personal medical data (but that assumes medical record keeping is going to creep out of the Dark Ages).

DRIVER:
Communications become one
Time frame: 2005

To achieve scalable networks and platforms, all types of networks and nodes must become one — mobile nets, distributed and point-to-point LANs, private and public wide-area networks, proprietary terminals, cluster interconnects and protocols and phone networks, including telephony switching mechanisms. A single switch standard will enable geographic routing and fault-tolerant structures.

Fiber-optic technology has brought greater bandwidth to the wide area than to the local area, and in the next four to 10 years, there could be a convergence of LAN and WAN with ATM into a single standard. The new ATM will eliminate network delay, enabling a world-scalable computer. With a single standard and a single network for local areas, campuses and wide areas, the high cost of networking could be reduced to the cost of POTS (a.k.a. Plain Old Telephone Service).

Phone communications will evolve toward a single, pervasive digital dial tone for high-speed networks. These will offer bandwidth scalable to several hundred megabits per second for handling video over phone lines and virtual reality.

DRIVER:
NT platforms
Time frame: Before 2000

My operating system of choice for the nodes on this worldwide network is

Everyone
is getting

Gordon Bell

Windows NT? Why NT you ask? Because it works on all the major hardware platforms — those from Intel Corp. and Mips Technologies, &c. as well as Digital Equipment Corp.'s Alpha, Apple/IBM/Motorola's PowerPC and Hewlett-Packard Co.'s PA-RISC. NT is compatible with today's 100 million Windows systems and has a massive and growing trained user base. NT makes server platforms commodities and standardizes them.

The impediment here is systems vendors that are stonewalling because they don't want to be compared based on servers — or what is basically a commodity.

NT's capabilities, including built-in SQL, provide nearly all the benefits of a single hardware architecture. Files can be carried on disk from platform to platform thanks to a single disk structure.

Unix must converge to permit applications to be distributed arbitrarily among client and server from any vendor. Once Windows NT begins to take market share from Unix, Unix consolidation will begin.

To help ensure openness, user companies might consider the Bell Rule of Two, which is, "Don't buy software unless it runs on two platforms, and then maintain applications on both platforms."

Again, the PC is the only platform that allows for one platform to run several operating systems for Windows applications. While supporting applications on more than one platform may cost a bit more initially, it will save money over the system's life and will help push standards.

DRIVER: Scalable computers
Time frame: 2000
(if you're an optimist)

Scalable computers can grow virtually without bounds and bottlenecks. Proces-

or large multiprocessors.

Scalable computers will enable every computer to be part of a cluster; in that way, companies can put together large computers by adding together many small ones. Ideally, the scalable computer should scale up to several thousand processor nodes. These computers connect to a high-bandwidth switch.

Multiple microprocessor NT servers operating as scalable clusters can provide the power of a mainframe without the high cost. We're already seeing some of that today through Microsoft's Tiger scalable server demonstration, which is essentially a coupling of PCs connected to an ATM switch.

In a scalable network and protocol environment, nodes net and are managed as distributed workstations and are also managed as a shared-memory multiprocessor.

Individual low-cost, high-powered PCs, such as Compaq Computer Corp.'s ProLiant, combined with Windows NT, SQL-based databases and a single communications network will form the heart of the scalable computer. You can say good-bye to mainframes, proprietary minicomputers, servers and workstations.

The wait times associated with networked computers will not be an issue thanks to scalable switches that allow network bandwidth to be automatically increased or decreased to support the intermode traffic. Lower latency, less overhead, increased reliability and constant cost are also keys to making this work.

Two standard switch candidates that can be used to build clusters are Tandem Computers, Inc.'s 700, which is due this summer, and a souped-up Myrinet from Myricom Corp., which would encompass Tandem's fault tolerance. There would no longer be the need for proprietary switches from different vendors.

DRIVER: True client/server
Time frame: 2000

In this vision of scalable networks and platforms, the role of clients and servers also changes. Today, you essentially have a client-centric version of computing brought about by workstations and PCs or a server-centric version, which is really just a more difficult to manage version of mainframe computing with a graphical front end.
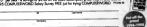
With scalable networks and platforms, you can expect multiple transactions among a number of computers, all of which do their own thing.

You get a glimpse of what will be possible by looking at the workings of the Internet: A client views something on a server and then either goes off on a parallel search of other databases or makes a transaction, such as paying for an item. In such an environment, you get computers that communicate with others and computers that act as agents and carry out compound tasks.

While only pieces of SNAP will materialize by 2000, think about this vision when you're answering that bottle of Asti Spumanti at Broadway and 7th Avenue.

COMPUTING ENVIRONMENT CIRCA 2000

- By 2000, 2 1/2-in. magnetic disks will cost less than 5 cents per megabyte and hold 200 bytes of information — about 30 hours of video or 20,000 books.

- With a single standard and a single network for local areas, wide areas and campuses, the high cost of networking will be reduced to the cost of POTS (a.k.a. the Plain Old Telephone Service).

- Bell predicts Windows NT will outsell Unix in 1995.

- The Bell Rule of Two: Don't buy software unless it runs on two platforms, and then maintain applications on both platforms.

That's zero-cost portability. Unix, by comparison, is portable, but someone has to recompile applications and translate them into formats for different machines. That's costly portability. As a result, I predict Windows NT will outsell Unix this year.

NT's built-in relational database and the various network server protocols equate to lower costs and reduced installation and maintenance charges.

True, client/server technology won't happen until ubiquitous and reliable networking occurs. The various dialects of

sors connected to a single memory pool act as independent computer nodes and are interconnected through a switch to communicate with one another.

Applications involving large amounts of data distributed through the enterprise can grow without bounds because multiple computers can act as one.

A scalable environment of networks and platforms lets users increase performance by scaling rather than having specialized bosses. Enterprise-level servers will be simple uniprocessor and multiprocessor Intel Pentium 7-based PCs

Computer Careers

LOW-TECH assessment

Products for gauging technical skills are few and far between

By Alan J. Ryan

By the poor hiring manager. There is an abundance of skills assessment software that tests proficiency in a variety of applications. However, few products gauge technical competency at the information system level.

"Right now, there's not a lot [of tools], but eventually one will see more types of certification and other tests," says Elleo Hersh, analyst of training and education services research at International Data Corp. in Framingham, Mass. "It's still a little ahead of its time."

The lack of products may explain why so few companies rely on formal tests where screening job candidates. A survey of 1,000 executives by OfficeTeam in New York reveals that only 9% of respondents test for technical proficiency at any level. More often, they rely on interviews and references for peace of mind.

Similarly, many placement and consulting firms say they seldom use formal testing software. For example, approxi-

mately 9% of Robert Half International, Inc.'s clients test candidates, and "most of that is done with a paper and pen," says Richard Wonder, national director at the IS division in New York.

Not satisfied with this response, *Computerworld* searched for skills assessment software and only found one IS-specific tool — Teekchek, a suite of testing products from Bookman Consulting, Inc. in New York.

Teekchek is an expert systems-based tool that consists of proficiency tests for more than 70 products. It includes tests for mainframe languages such as CICS, DB2 and job control language; tests for PCs such as dBase and Microsoft Corp.'s FoxPro; and tests for multiplatforms, including Oracle Corp. and Sybase, Inc.'s database software and PowerBuilder from Sybase subsidiary Powersoft. Companies that purchase tests administer them at their own site and send the answers electronically to Bookman Consulting, which then scores and returns them within 24 hours.

Yet the lack of IS-specific skills assessment software doesn't worry some recruiters. To them, testing is often a luxu-

ry, not a necessity. In fact, according to Hersh, companies base their hiring decisions on several factors, with most preferring old-fashioned experience.

"That's not to say testing is unimportant; it's just not the highest priority" in the hiring process or the best way to measure someone's capability, Hersh says.

Wooder's IS background allows him to verbally test candidates on technical proficiency. Moreover, Robert Half interviews people many times before it places them with a client company, he says.

Safety precautions

Even so, verbal tests aren't a reliable enough safety net for everyone.

Denise Silver, manager of business systems engineering at Provident Mutual Life Insurance Co. in Philadelphia, has been on both sides of the testing debate.

A former Cobol programmer, Silver is able to weed out real expertise from fabrication when interviewing Cobol programmers. But this isn't always enough, according to Silver. "My greatest questions would help me find the holes in their resumes," Silver says. "But with the technical assessment, we really didn't get a feel for how much real Cobol experience they had."

Silver turned to Teekchek and no long-

er worries that "interview savvy" candidates can slide through the screening process. "We also don't have to use our resources to sit down and discuss the nitty-gritty of program code," she says.

However, conducting tests on all qualified candidates can be pricey. For example, it costs $300 per month to lease a test from Bookman Consulting or roughly $250 per single test.

But if you're committed to the idea and plan to use a skills assessment package, be sure you get accurate results. "Before we ever bought a testing product, we validated it internally," says Renee Southard, manager of human resources at Keane, Inc., a Boston-based consultancy. The company administered Teekchek to 16 workers with known technical proficiency, and the results closely correlated to Keane's assessment of their skill levels.

As far as testing is concerned, analysts predict most companies will keep using their own verbal or proprietary assessment tests for the moment. Eventually, user companies will market the testing instruments they have already developed internally, Hersh says.

Ryan is a freelance writer in Pascoag, R.I.

Resource Leaders

The interview is important — but is it enough?

Even for basic software applications, companies rely on an applicant's word about skill level. The primary methods for evaluating software proficiency include:

Bookman Consulting, Inc.
New York
(212) 819-1955

Techcheck is a expert system-based tool that includes proficiency tests for more than 70 products, some of which are highly specific. For example, there are eight versions of the Cobol test but for languages that are generic and portable, such as C, there is only one version.

The tests keep score by weighting each question's complexity. All test takers start at a middle level, and as they progress, the questions become easier or more difficult based on the taker ability.

As an expert system, Techcheck weights questions and answers several ways. For example, a multiple choice question might ask: "Which of the following states are in the U.S.?" New York, South Dakota, Washington, D.C., Puerto Rico and Tokyo are then listed as possible answers. To get full credit, the test taker must answer New York and South Dakota. If he selects Wash-

ington, D.C., or omits one of the other states, credit is cut from his score. If he selects Tokyo, he loses more points than if he selects Washington, D.C. "We don't tell you how many answers to pick, but the [wrong] answer

TOOLS THAT TEST

[of] Tokyo would outweigh your correct answer of New York," says Harvey Bookman, president of Bookman Consulting.

Bookman contracts with programming experts in 15 states who work on developing and reviewing the tests, which are continuously updated. Vendors are also often asked to review tests that specifically relate to their products, he adds.

Test questions, which must be answered in 45 to 60 minutes, are based on several factors: practical experience, technical understanding and necessary knowledge. Other questions relate to complex code to assess how deeply the test taker can think and whether he has actually used the product.

Scores, ranging from 0 to 40, are based on the level and complexity of questions and answers. For example, a score of 23 indicates a user is fully proficient, Bookman says. "There are a lot of egos in programming. Everyone thinks he's great, but the average mark is 16 to 17."

Bersin, Inc.
San Francisco
(415) 626-6200

Skills Management System: Does not test skills. Rather, it aids in creating development and training plans to help workers build skills. Can also maintain database of employee skill levels.

Price: Depends on number of employees. Ranges from $2,600 to $70,000 for a multidepartment license.

Computer Training & Support Corp.
Livonia, Mich.
(800) 884-2872

Skills Assessment Tests:

Assesses skill levels on a variety of applications. Evaluates training required, success of training programs and ensures proper placement of employees for software training. Allows multiple users to take tests simultaneously.

Price: From $169 to $295 for single-user licenses; $595 per test series for network versions; $795 for training administrator versions.

Individual Software, Inc.
Pleasanton, Calif.
(800) 822-3522

Skill Assessment Software: Assesses skill level for word processing, spreadsheet, data-

base, electronic-mail and graphics applications. Software can be used to determine training requirements or measure course content retention. It is also integrated into the company's computer-based training software.

Price: From $89.95 for single-user license; up to $2,275 for network version of training suite package.

Know It All
Philadelphia
(800) 935-6694

Prove It! Testing Software: Helps verify software proficiency for most popular software applications. Tests feature 25

questions and can be completed in 15 minutes. Results are automatically scored and printed.

Price: $380 for individual tests; pricing varies for packages and starter kits.

Park City Group
Park City, Utah
(801) 645-2106

ActionForms: Incorporates computer-based training and testing for new employees; provides security measures that prevent employees from memorizing test programs. One module facilitates hiring people who perform with honesty, high sales and service productivity and longevity.

Price: Varies based on number of user sites and hardware.

SHL Kee Systems, Inc.
Columbia, Md.
(410) 290-2350

Analyst: Assesses knowledge of operating systems, spreadsheets, word processing, databases, desktop publishing and specialty packages such as Microsoft Corp.'s Mail 2.0. Used to assess appropriate training levels and determine course content retention.

Price: Modules start at $200; up to $2,405 for network version for one to five users; site licenses available from $6,000 to $32,000-plus.

Marketplace

"What should you keep in mind when buying client/server development tools?"

A forum where buyers offer and receive advice from peers about product selection.

**Senior analyst,
Roseville Telephone Co.,
Roseville, Calif.
Uses: Bachman Information Systems, Inc.'s Ellipse**

"Always try it before you buy it. We look 14 months [to decide on a tool], and the time was well worth it. [Products] ranged from very cheap to very expensive, but they all roughly did the same things. We established a lab with different databases, different hardware platforms for the clients and servers and several different development tools. We looked for weaknesses in the product.

"We didn't have to spend as much setting up the lab as you would think because the vendors were cooperative about loaning products. Even if they didn't, you're going to spend millions on client/server and you have to get it right."

**Manager of micro development and support, administrative information services, Columbia University, New York
Uses: PowerPlace Systems, Inc.'s VisualWorks, saying Microsoft Corp.'s upcoming Visual FoxPro**

"Pick your tools after you've explored your issues. One consideration is a vendor's training and support. Another is where you want your organization to be. We needed an object-orient-

ed tool because we need to be in that environment in a university setting. Also, consider your staff. There will always be staff transitions, but you don't want to introduce unnecessary complexity. We chose the tool [that] would be the most accessible based on our existing skills.

"Establish cardinal and strategic solutions. For instance, we started using [a screen scraper] to put a bappy face on complex instruction set computing applications. That was a tactical solution to an immediate problem, it gave us access to a primitive client/server-type of environment and helped us gain concession that this was a direction in which we wanted to go. A strategic solution would be one that takes advantage of the campus Fiber Distributed Data Interface backbone and provides interoperability of data servers, application servers and so forth."

**Vice president, project management division, SE Technologies, Houston
Uses: Powersoft's PowerBuilder**

"We choose the product that we thought would be easiest to use. The other issue was that you want to keep costs down. We think we found a solution that [will] help us distribute our software more cost-efficiently. For instance, we wanted to know

how little we could charge for a runtime license. With [Power-Builder], we can produce a runtime version at minimal cost."

**Executive vice president and chief information officer,
Chevy Chase Bank,
Chevy Chase, Md.
Uses: Micro Focus, Inc.'s Workbench**

"Your client/server foundation is as important as the tools themselves. We looked first at our infrastructure from 20,000 feet. We have three server platforms — OS/2, Unix and MVS — strong middleware and a sound network. We know where 70% of our applications are going to reside. Once we had the infrastructure in place, we led the infrastructure decisions so they can then be viewed and studied by the people who have to construct the code and implement the design. Look for tools that record analysis decisions so the designers can study the requirements and figure out how to design them for client/server.

"Then we needed the tools for change control, problem management, configuration management and software distribution. We must have all these tools in place for global service and manage as much if as we can centrally so that we won't have costs all over the place."

**President and managing director, Financial Technologies International, New York
Uses: Sterling Software, Inc.'s Key for Enterprise products,
Microsoft's Visual Basic,
Powersoft's PowerBuilder**

"The most important items in client/server applications are design and architecture. Design means you can break elements of the applications into layers or tiers, and you can clearly document those layers in a design tool. Architecture means you can construct the layers in ways that make it easy to change the layers. You should look for tools that help you do these things.

"You need tools that help you record design decisions so they can then be viewed and studied by the people who have to construct the code and implement the design. Look for tools that record analysis decisions so the designers can study the requirements and figure out how to design them for client/server.

"You also need tools to construct the application that will produce code with reusable layers [such as] the data access layer, the connectivity layer, the end and validate layer and the actual visual screen. Then a construction team can take those layers and decide where they should reside — on the client or the server. You can

build any part of the application with any of the tools, such as the client code in Visual Basic and the server code in C but make sure you can marry them."

**Principal consultant,
Price Waterhouse,
Falls Church, Va.
Uses: Captiano Computing Systems Ltd.'s LogicWorks, Powersoft's PowerBuilder, SQA Team-Test, PowerClass**

"In general, we recommend looking at five things. Compatibility: Is it compatible with multiple environments? Is it compatible with your existing databases and other products? Scalability: Will you be able to continue using the tool as you grow into larger environments? Will it let you create applications that grow as you grow? Simplicity: Can you train new people to use it quickly? Affordability: The cost of the software tool is the last thing you should consider. You should ask if it is affordable in terms of the manpower resources it uses? What does it cost to distribute the applications? What are the runtime costs? What kind of memory overhead does it require? Durability: How long has the vendor been around? How much money has it invested in the product, [and is it] well-supported?"

Compiled by Leslie Goff, a freelance writer in New York.

MARKETPLACE

Services

MARKETPLACE

Companies in this issue

Page number refers to page on which story begins

Gainers   Losers

Percent

Dollar

Internet payoff

A pair of technology stocks has been cashing in on the Internet's burgeoning growth, one by providing on-line services and the other by supplying hardware to Internet providers.

Netcom On-Line Communication Services, Inc. (NETC) operates a proprietary network that hooks in to the Internet. By using Netcom's local Points of Presence (POP), users can access the Internet via a local telephone call. Currently, about 50 POPs are in place, with 130 expected nationwide by the end of the year.

The stock's growth will be driven by two factors, said Gregory Curhan, an analyst at Volpe, Welty & Co. in San Francisco, who rates Netcom a strong Buy (see chart). He estimates there will be 220,000 Netcom subscribers by December, though there will not be a shortage of competition.

"On-line services are still more expensive than Internet access companies, which have a price advantage. But online services have more customers right now," Curhan said. To compete, Netcom is expanding its national network and inking bundling agreements to be NetCruiser Internet browsing software.

Ascend Communications, Inc. (ANSD), whose MAX server is in place at most Internet providers, supplies the POPs that give users local phone call Internet access. These providers include Netcom competitors UUnet Technologies, Inc., MCI Communications Corp. and Performance Systems International, Inc. Netcom does not have the product because its network does not use integrated Services Digital Network. The MAX server supports up to 96 users and eliminates the need to use piles of modems to handle dial-in access.

Since its initial public offering listing of 13 last Mr. Ascend shares leaped to 61¾ last week. "It's a go∞∂ price," said Charles Rosson, an analyst at Balvera Capital in New York. "On the other hand, it's a class company with top products. And if earnings don't deviate, there's a reason why they can't support it." — *Tim Ouellette*

Net worth

The projected Netcom stock price, much like stock prices for paging and cellular telephone companies, is based on the number of subscribers. The price is estimated to increase by $1.35 for every 10,000 new subscribers.

SUBSCRIBERS	220,000	230,000	240,000	250,000
STOCK PRICE	$32.90	$34.25	$35.60	$36.95

Source: Volpe, Welty & Co., San Francisco

Supermarket chain shelves object plans

and we'll go groceries," said Denise Matthys, a former Unix development manager now in charge of coordinating the outsourcing project. "Some of the technology was a lot of fun, but there were probably some other technologies we would have used that would have delivered quicker."

Back to the here and now

Under ever-intensifying competitive pressure from larger chains such as $6 billion Publix Super Markets, Inc., Kash n' Karry now must begin "concentrating on the retail side of the business vs. spending so much time on developing systems," said Ron Johnson, the company's new chief executive officer.

Johnson, who was appointed in January — the month after the company emerged from Chapter 11 bankruptcy proceedings — and last week that he intends to steer Kash n' Karry well outside of the IS research and development arena.

"Everything is being outsourced," Johnson said. He added that all previous object technology development plans "are on hold right now."

This strategy contrasts sharply with management's thinking two years ago.

"Before, because of the competitive situation in their industry, they felt some need to acquire a strategic advantage by using" information technology, said Win Burke, who as Chevron's former vice president of marketing worked closely with Kash n' Karry's object development group.

"They felt a very flexible, very reactive information system would allow them to be quicker and more nimble in making pricing and inventory changes and decisions," said Burke, who is now president of ObjectLink Technology, Inc. in Lincoln, N.H.

Kash n' Karry will continue to use a 2-year-old object-based warehousing application and another object-based promotional pricing system already in production. Both systems run on Sun Microsystems, Inc. SPARC workstations and servers, which sources said will be turned over to GSI as part of the outsourcing deal.

Beyond these systems, however, "we're not adding any new [object-based] systems or really focusing on them," Matthys said.

Instead, Kash n' Karry will work with GSI to roll out a new mainframe-based procurement system and store-based POS systems to replace 20-year-old proprietary technology developed when Kash n' Karry was still part of Lucky Stores, Inc., another grocery chain. Kash n' Karry now has 132 stores.

Initiative thrust aside

Earlier this year, Kash n' Karry had been evaluating a procurement package from IBM-owned Worldwide Chain Store Systems, Inc. in Chicago, according to Bonnie Van Overbeke, Kash n' Karry's former chief information officer.

Like the others, Van Overbeke characterized Kash n' Karry's decision to arrest object development as "hard." It is a decision other IS executives in the industry can well understand.

"Object [technology] is certainly something we're interested in, but we haven't been able to get there yet. I don't know very many grocery chains that have," said Bob Bray, vice president of IS at Furr's Supermarkets, Inc., a 70-store chain in Albuquerque, N.M.

"Most groceries are struggling just to get applications out the door," he added. Still others, Furr said, opt to outsource — not so much to cut costs, but to raise cash by selling equipment.

Beyond bar coding

Retailers see new and those they plan to use by 1996.

Product category management systems	26%
Cross- docking	54%
Computer- assisted ordering	6% 37%
Activity- based costing systems	6% 38%
Sales forecasting systems	12% 50%

1994 1996

Source: Food Marketing Institute, Washington

Coexistence

But users said they are willing to put up with the added hassles to avoid the potentially bigger problem of doing too much client/server too soon. Some key application vendors with mainframe and client/server customers are also recognizing this call for coexistence and starting to produce the tools their customers need to make it happen (see story at right).

"The complexity it creates is worth it because of the perceived amount of risk from jumping into client/server," said David Klimetz, manager of accounting systems at FedEx in Memphis.

The renegade few

Peter Marton, a group vice president at Cambridge Technology Partners in Cambridge, Mass., said he sees plenty of users taking the slow road to client/server. The reasons range from their having too much invested in large systems for a sudden migration to the difficulty of making organizational changes to simply recognizing that some applications still perform best on centralized mainframes.

"Behind every revolutionary, there are three or four companies taking a more conservative approach to it," Marton said.

FedEx, for example, is scheduled by month's end to complete its migration from an in-house system to a client/server-based program from Dun & Bradstreet Software in Atlanta. It plans to maintain its older general ledger system, which runs more than 1 million transactions during monthly closings, on a mainframe and then download data from it to fixed assets as needed.

"When we become convinced that a product will meet our performance and volume needs, we will make the shift," Klimetz said. "But right now, we are not ready to do that. What you do is take applications a piece at a time."

Reliability key

Cinda Hallman, vice president of global IS at Du Pont, said she expects the company to continue using SAP AG's R/3 mainframe applications quite indefinitely to support its core operations. Du Pont is also installing SAP's client/server offering, R/3, where it makes sense to have a more interactive, graphical system.

"We anticipate that, for the foreseeable future, we will be using R/2 and R/3," Hallman said. "We believe that with our volume of transactions we need something like R/2 that is more reliable, more proven and predictable."

In it for the long haul

SAP AG and D&B Software apparently recognize that coexistence strategies are key for many customers.

SAP intends to release middleware technology later this year that will help users link R/2 and R/3. Currently, there is no straightforward way to do this, and a lot of customers are interested, said Eric Keller, an analyst at Gartner Group, Inc. in Stamford, Conn.

Meanwhile, D&B Software plans this month to rename InterQ, its middleware offering, to SmartStream Connect. This follows an overhaul the product underwent late last year to provide two-way data sharing between mainframe and client/server applications, rather than one-way downloads to the SmartStream platform.

— Rosemary Cafasso

For Steelcase, Inc., a $2 billion office furniture company in Grand Rapids, Mich., coexistence is also a must. The firm recently completed a migration of two key financial functions to a SAP R/3 platform, but it will keep other financial programs on its mainframe for the near term.

Interface tie-ups

Diane Schwarz, manager of financial systems at Steelcase, said the most time-consuming piece of the migration project was writing interfaces to the client/server applications and applications to the mainframe-based software. The plan to maintain both mainframe and client/server systems does mean "duplication of costs" for the short term, but the company believes it is worth it, she added.

"It is too much of a business risk to do a big-bang approach for a company this size," Schwarz said.

At United HealthCare Corp. in Minneapolis, IS decided to wait for more progress on the systems reliability front before making any big leaps. The company is installing a fixed assets package from D&B Software and plans eventually to move other financial programs over to the new platform.

"From what I can tell, the base infrastructure is just not mature yet with things like security," said John Christopherson, director of IS planning and financial systems. "We want to make sure we are really comfortable and have the infrastructure in place."

Speaking in K n'K tongues

Kash n' Karry's adopted object technology to gain business advantage through the use of flexible systems based on reusable code.

A team of talented IS staffers examined the K n'K Language, a customized set of C++ object-oriented code, to build Unix applications that run on Sun servers and workstations. But an effort to use an off-the-shelf application development package from tiny Oberon Software pooped out in early 1994 when Oberon's Japanese investors ordered a changeover from Unix to Windows technology.

The biggest object-oriented production application is running in a return process-

ing center at Kash n' Karry's central warehouse. That application catalogs the damaged and returned items collected from all stores. Senior managers have also used object-based executive information systems to display store sales on Sun workstations.

For now, Kash n' Karry will continue to use the SunOS Unix applications, five Sun servers and 25 Sun workstations it already has in place. But as new developers of Sun applications or object-oriented applications is planned.

A Sun SPARCserver 1000, which retails for about $60,000, was intended for use with the Oberon software. It now stands idle.

Telecommunications fights for IS

Between now and 2000, telecommunications companies and computer companies are going to be moving on to similar turf and, in many cases, competing for the same turf. It may prove surprising how adept the telephone companies become at providing some common computer services. The competition means the IS manager will face choices, and some will lower his costs and simplify his life.

Today, an early adopter of Lotus' Notes can install the application throughout a company, train users and support many workgroups' efforts to create and edit shared documents.

Tomorrow, a Notes user will be able to do the same thing within a company and with far-flung subsidiaries, outside suppliers, partners and consultants. But instead of having to install the application and train and support those remote users, the IS manager will be able to sit back and let AT&T download the application from servers on its long-distance network, manage the training and provide the support. And the expense of such an arrangement might be less than that of the self-installed application because a small core partnership of Lotus/AT&T IS staffers will have the capability to manage thousands of sites.

Indeed, it's hard to see why a business wouldn't purchase full-scale LAN services from a telecommunications supplier rather than purchase a LAN operating system from a computer software house. The IS manager knows, for example, that her PCs come from several suppliers, her network's interface cards from another supplier, the network itself from Banyan and Novell and the workstation network from Sun. If a user calls and says the network is down, the IS staff may be sorely taxed to find the cause.

What if the LAN was available like the dial tone on your phone? You've noticed that the phone system works during a power outage when other electrical devices fail. What if you

could be guaranteed that kind of reliability for your LAN at a lower price from a telecommunications supplier?

Telecommunications suppliers are likely to become software services suppliers because much of the analog phone network has been converted to digital switches. Digitized data, including complex graphics and video, now moves around the long-distance network as easily as voice, although the last mile to the customer is often lacking full digital capacity.

Pacific Bell is planning on bringing integrated Services Digital Network (ISDN) capability to 7,400 public schools and libraries in California as a demonstration project of what full digital network services can do. In Seattle, Microsoft is asking the issue ISDN available to the company and to the neighborhoods of its employees. Such an infrastructure would promote work-at-home and other decentralized work arrangements.

In effect, the digitization of the telephone network promises to continue the wave of outsourcing that saw Kodak, Xerox, Bethlehem Steel, Southern Pacific Railroad, Continental and Delta move much of their IS functions out the door. But in the future, internal network and application services will be purchased off servers on an external network rather than installed internally and maintained by contractors.

In some ways, the telephone companies, with their strengths in complex network monitoring and billing systems, are in a better position to supply mass computer services than computer makers are. After all, the likes of IBM, Digital and Sun want to place advanced equipment in your hands and let you produce the networks and applications. But just as the number of telephone operators could not keep pace with the increase in telephones, the number of IS staffers is unlikely to stay in step with the expansion of computing and the demand for services.

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> The phone system works during a power outage. What if you could be guaranteed that kind of reliability for your LAN — at a lower price?